Single Aisle
TECHNICAL TRAINING MANUAL
T1+T2 (IAE V2500) (Lvl 2&3)
WATER & WASTE

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WATER & WASTE

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WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW

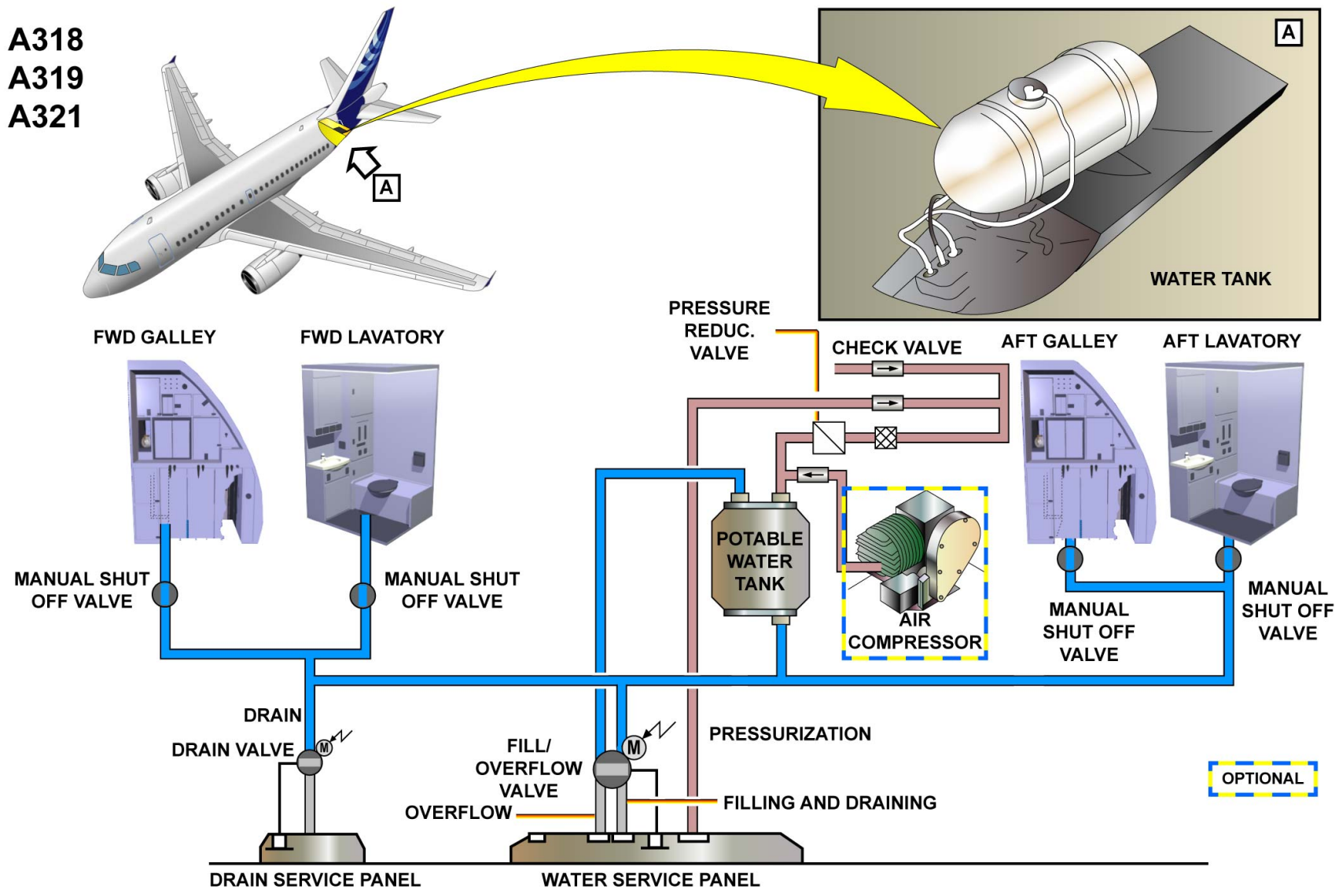
The water and waste system consist of three subsystems:
- potable water system,
- waste water system,
- toilet system.

WATER FLUID STORAGE (A318 / A319 / A321)

The potable water tank is installed in the pressurized LH underfloor area rear of the aft cargo compartment. An indication system monitors the water quantities.

POTABLE WATER SYSTEM

The potable water system supplies water from the water tank through a distribution system to the user. The water is supplied to water faucets in the galleys and lavatories. The system also supplies water to the water heaters and vacuum toilet units. Mechanically or electrically operated valves control the supply of the potable water system. Compressed air is used to pressurize the system to supply water from the tank to the necessary service locations. The air pressure is supplied from the bleed air system in normal configuration or a ground pressure connection for maintenance. An air compressor can be installed as an option. Each lavatory can be isolated from the potable water distribution system through a manual shut-off valve.



SYSTEM OVERVIEW - WATER FLUID STORAGE (A318 / A319 / A321) & POTABLE WATER SYSTEM

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

WATER FLUID STORAGE (A320)

For the A320 only, the location of the potable water tank is aft of the forward cargo compartment.

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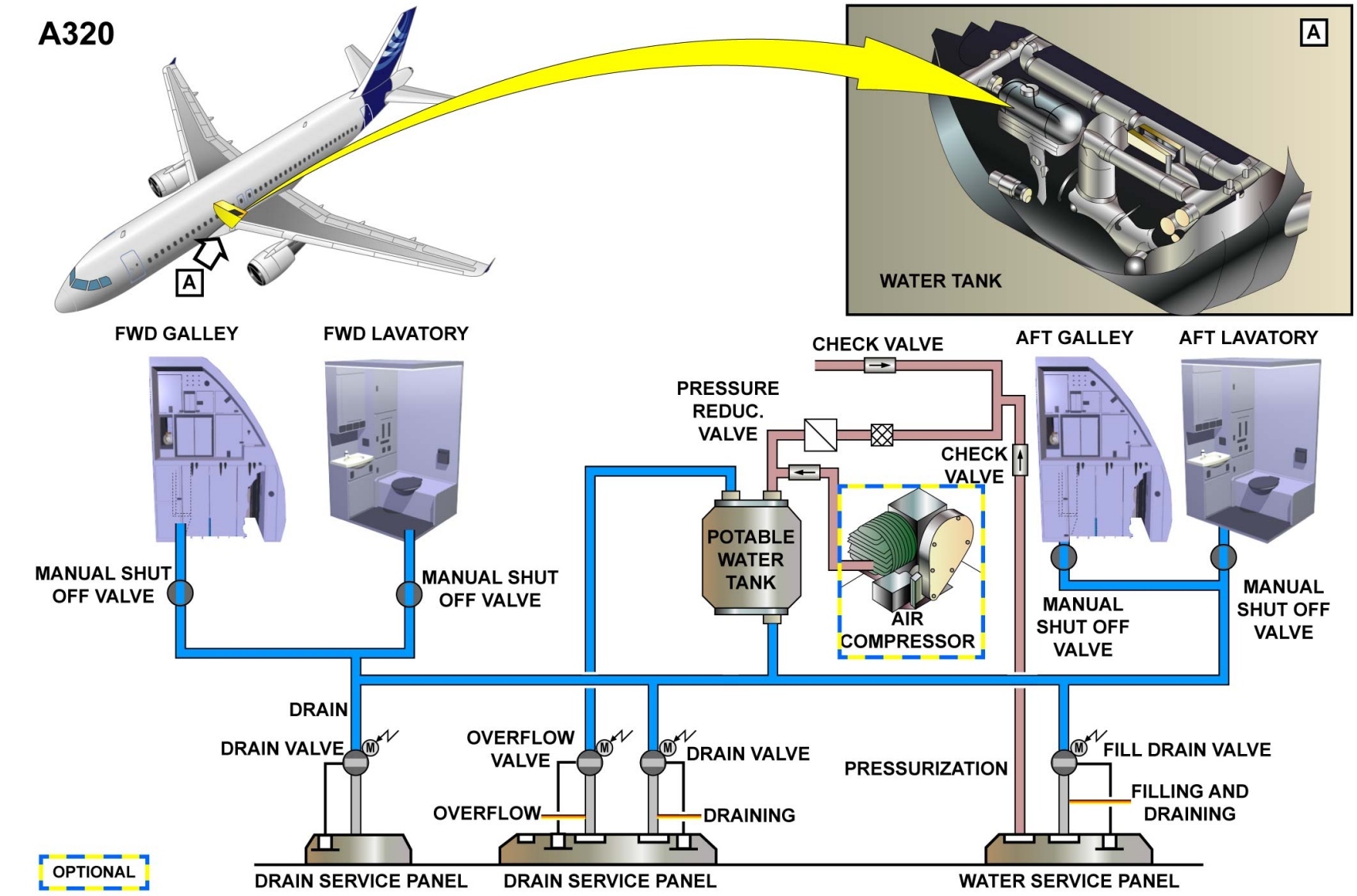


SYSTEM OVERVIEW - WATER FLUID STORAGE (A320)

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

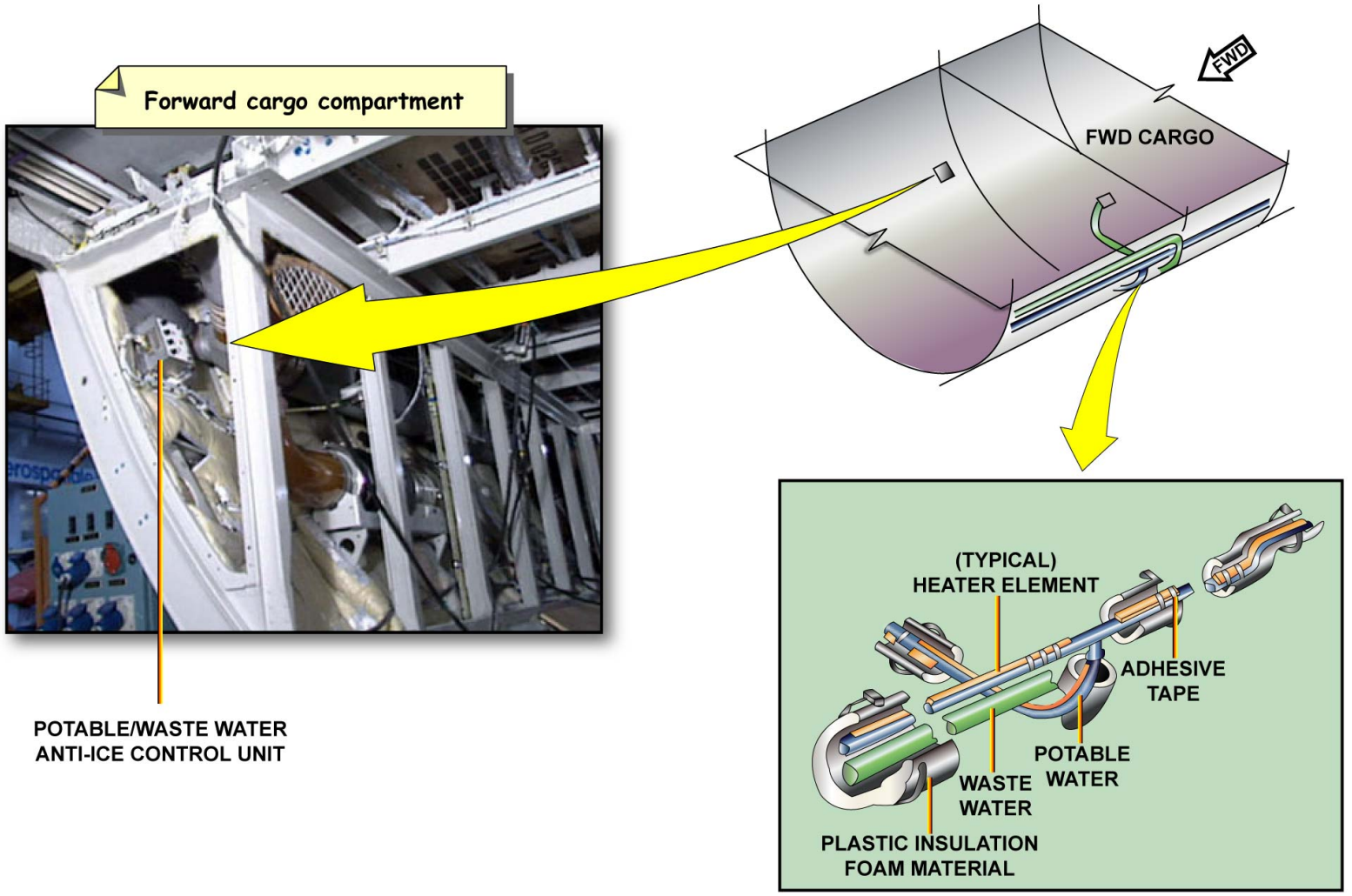
POTABLE WATER HEATING, ICE PROTECTION AND WINTERIZATION PROTECTION

One water heater is installed in each lavatory and in each galley. Water pipes, where icing conditions can occur are insulated and heated by tape electrical heaters. The heating elements are controlled automatically by two anti ice control units installed in the cargo compartments.

The potable water service panel heating is installed to prevent ice formation in the potable water servicing panel in icing conditions.

Optionally the fill/drain nipple as well as the overflow nipple are electrically heated to prevent ice formation of the remaining water in the fill/drain nipple and overflow nipple which could cause a blockage or damage to the nipples.

A thermostat controls the potable water service panel heating. In winter conditions, the potable water system must be drained during night stops.



SYSTEM OVERVIEW - POTABLE WATER HEATING, ICE PROTECTION AND WINTERIZATION PROTECTION

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

POTABLE WATER CONTROL AND INDICATING (FAP)

The water and waste indications are displayed on the Flight Attendant Panel (FAP). On the FAP, the quantity indication is displayed automatically as soon as the service panel is open, or when the Water/Waste key on the FAP is selected. As an option, the filling quantity can be selected (25%, 50%, 75% and 100%).

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FLIGHT ATTENDANT PANEL (FAP) WATER/WASTE PAGE

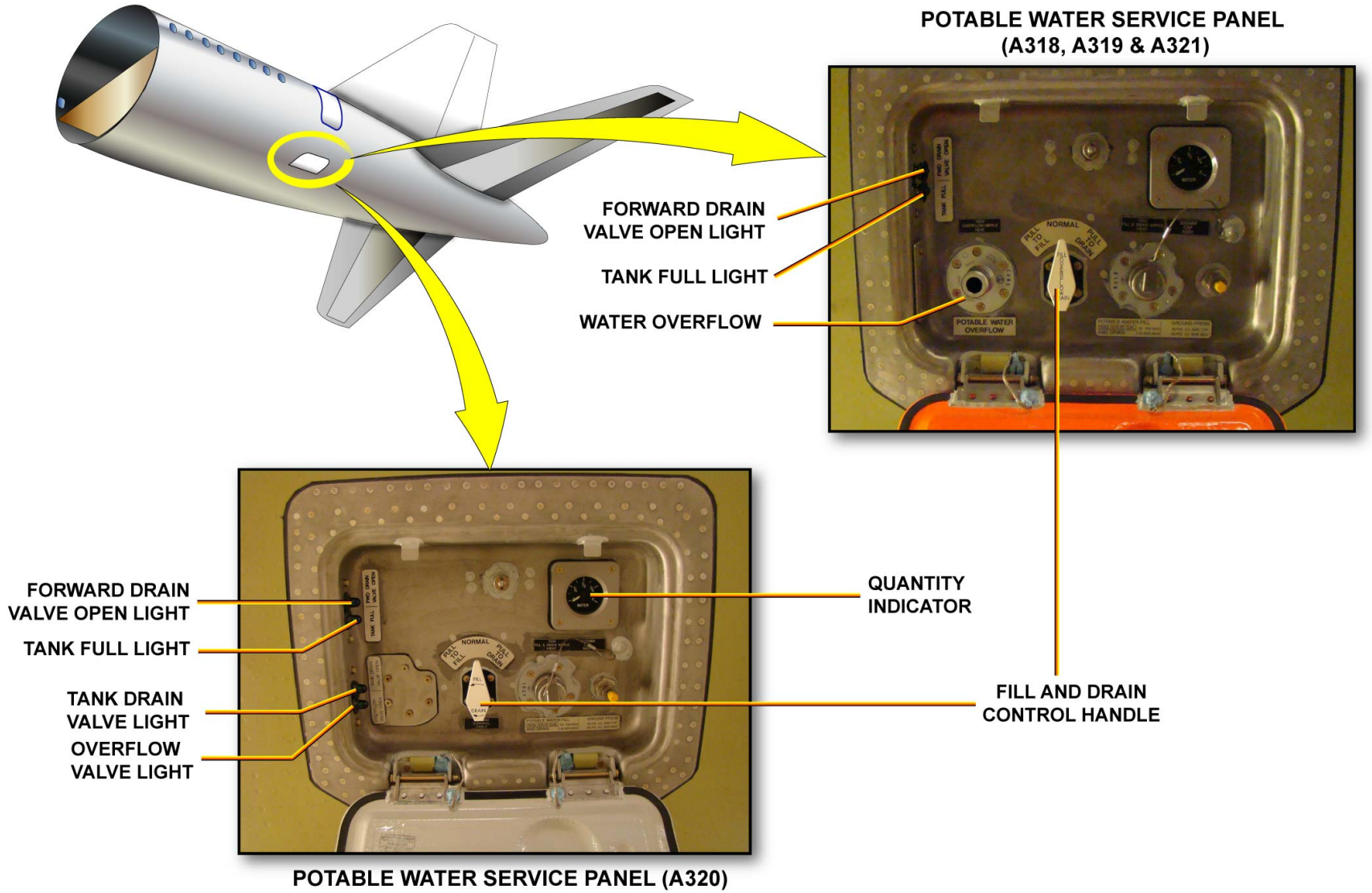
SYSTEM OVERVIEW - POTABLE WATER CONTROL AND INDICATING (FAP)

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

POTABLE WATER CONTROL AND INDICATING (SERVICE PANEL)

There is only one control handle to fill or drain the water tank. It is located on the water service panel. One forward drain valve is electrically controlled when the fill/drain control handle is set to the drain position. On the A320, the overflow valve opens electrically when the fill/drain control handle is set to the drain or fill position. On the servicing panel, the indicator gives the water quantity. One green light indicates that the forward drain valve is open and one green light indicates that the tank is full.



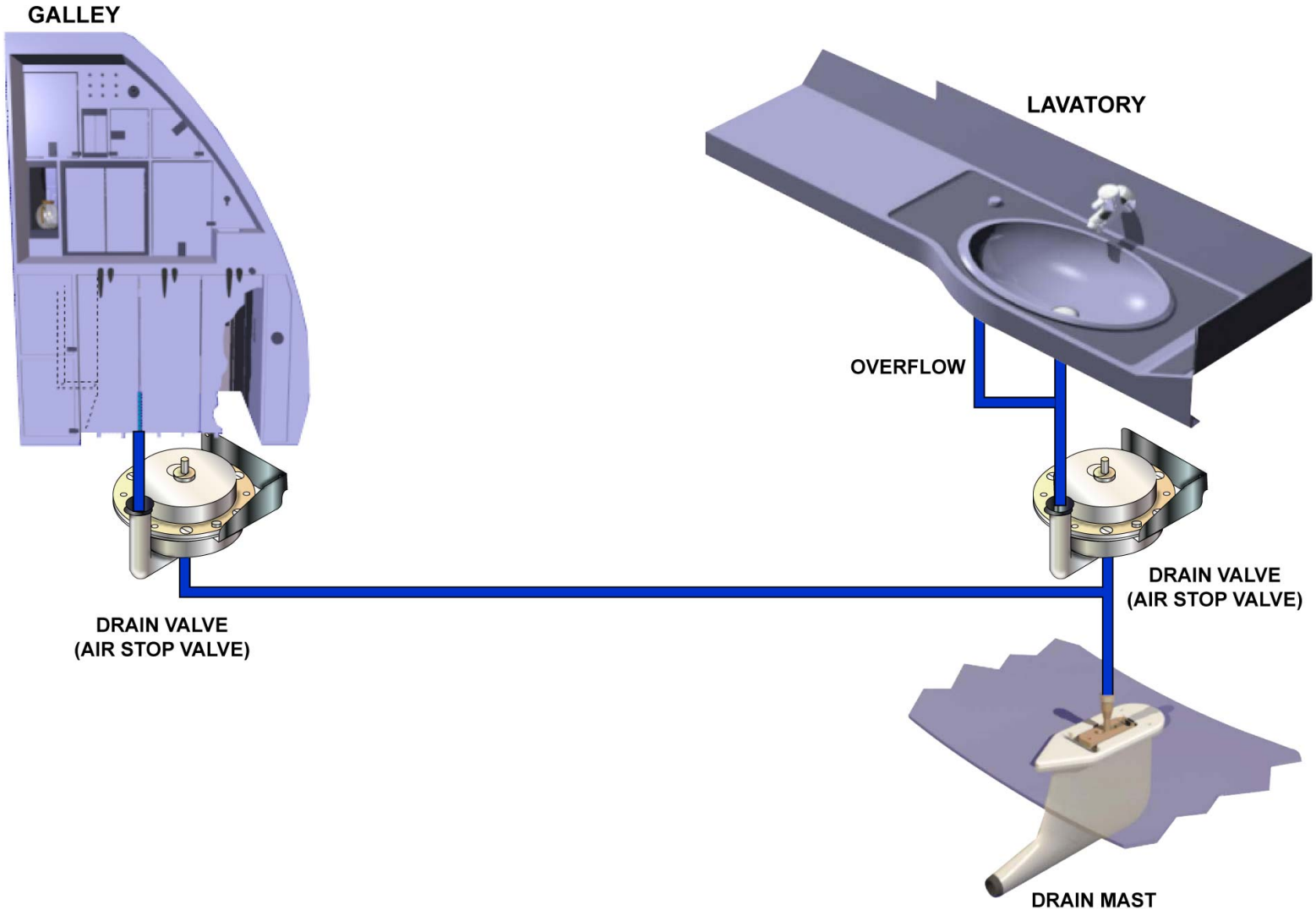
SYSTEM OVERVIEW - POTABLE WATER CONTROL AND INDICATING (SERVICE PANEL)

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

WASTE WATER SYSTEM

The waste water system drains the used water from the lavatory washbasins and the galley sinks. The waste water is discarded overboard outside through the drain valve and the drain mast. The two drain masts have integrated electrical heating elements to prevent ice formation in flight and during cold weather.



SYSTEM OVERVIEW - WASTE WATER SYSTEM

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW (continued)

TOILET SYSTEM

The toilet system gives sanitary facilities for the passengers and crews. The system is a differential pressure toilet system and uses potable water for flushing.

TOILET SYSTEM FLUSHING OPERATION

The system uses potable water from the aircraft pressurized water system to flush the toilet. A flush valve opens to remove waste from the toilet bowl to an under floor waste holding tank. At high altitude, the differential pressure between the cabin and the atmospheres is sufficient to move the waste from the toilet bowl into the waste holding tank. At low altitude or on ground, a vacuum generator starts to give the necessary differential pressure in the waste system to move the waste from the bowl to the tank. The Vacuum System Controller Function (VSCF), integrated in the Cabin Intercommunication Data System (CIDS), controls the flushing system operation and stops the operation when the waste servicing panel is open. When the tank is full, the liquid level sensor stops the system operation.

TOILET SYSTEM WASTE DISPOSAL

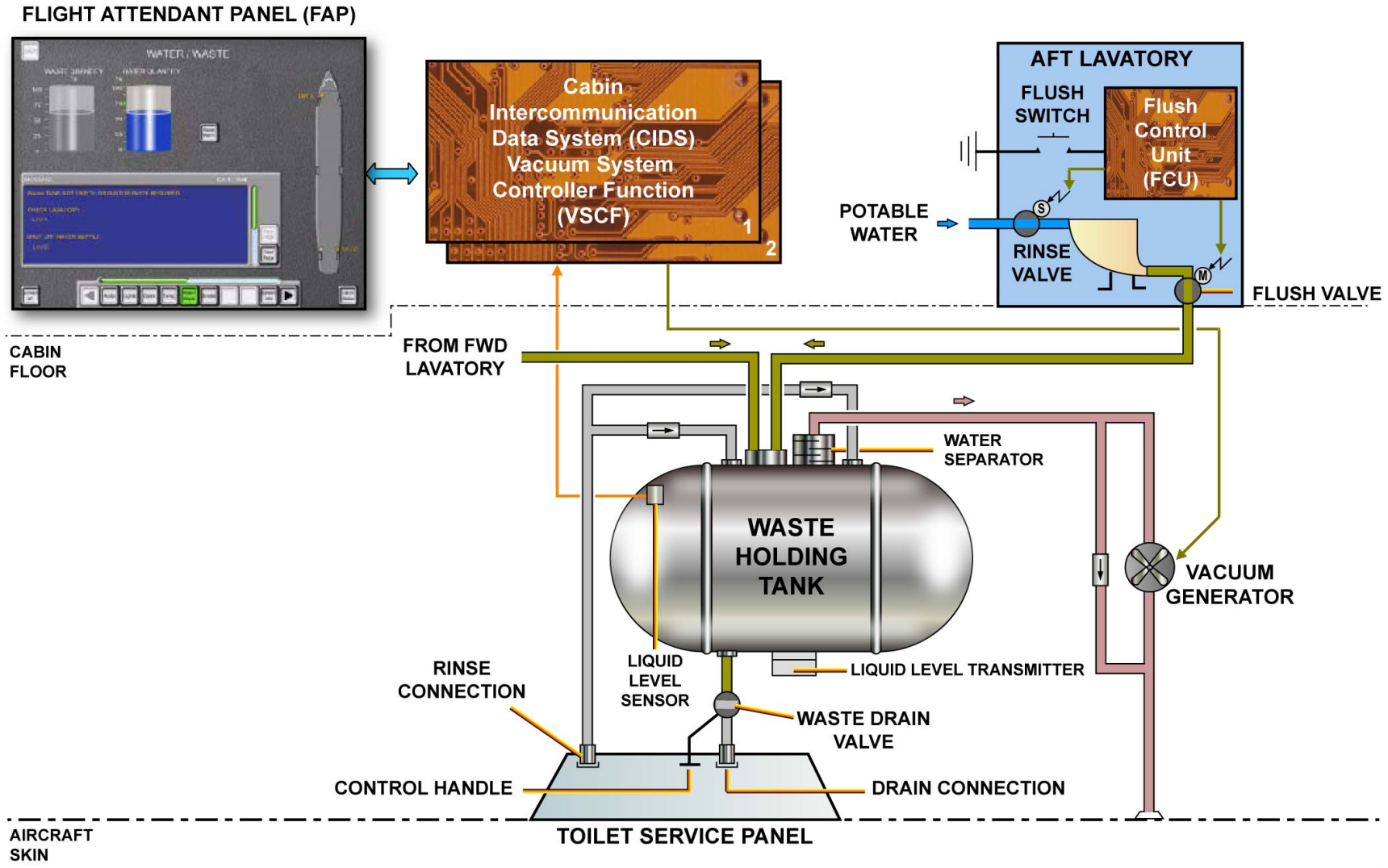
The waste holding tank is installed on the right of the aircraft under the floor behind the bulk cargo compartment. The tank includes a water separator, a liquid level transmitter, a liquid level sensor, a waste drain valve and two rinse line connections.

TOILET SYSTEM WASTE TANK HEATING (OPTIONAL)

The waste holding tank can be insulated. The lines between the tank and the service panel with the waste drain valve can be insulated and heated.

TOILET SYSTEM CONTROL AND INDICATING

The vacuum toilet system is connected to the CIDS. The CIDS controls and monitors the system functions and the related electric components. A Flush Control Unit (FCU) per toilet controls the rinse and flush cycle as soon as the flush SW is pressed. The system uses potable water from the potable water system to rinse the toilet bowl. When the waste holding tank is full, a signal is sent to the CIDS, which shuts down the toilet systems. The FAP displays the waste tank quantity stored in the waste holding tank when the Water/Waste key on the FAP is selected.



SYSTEM OVERVIEW - TOILET SYSTEM ... TOILET SYSTEM CONTROL AND INDICATING

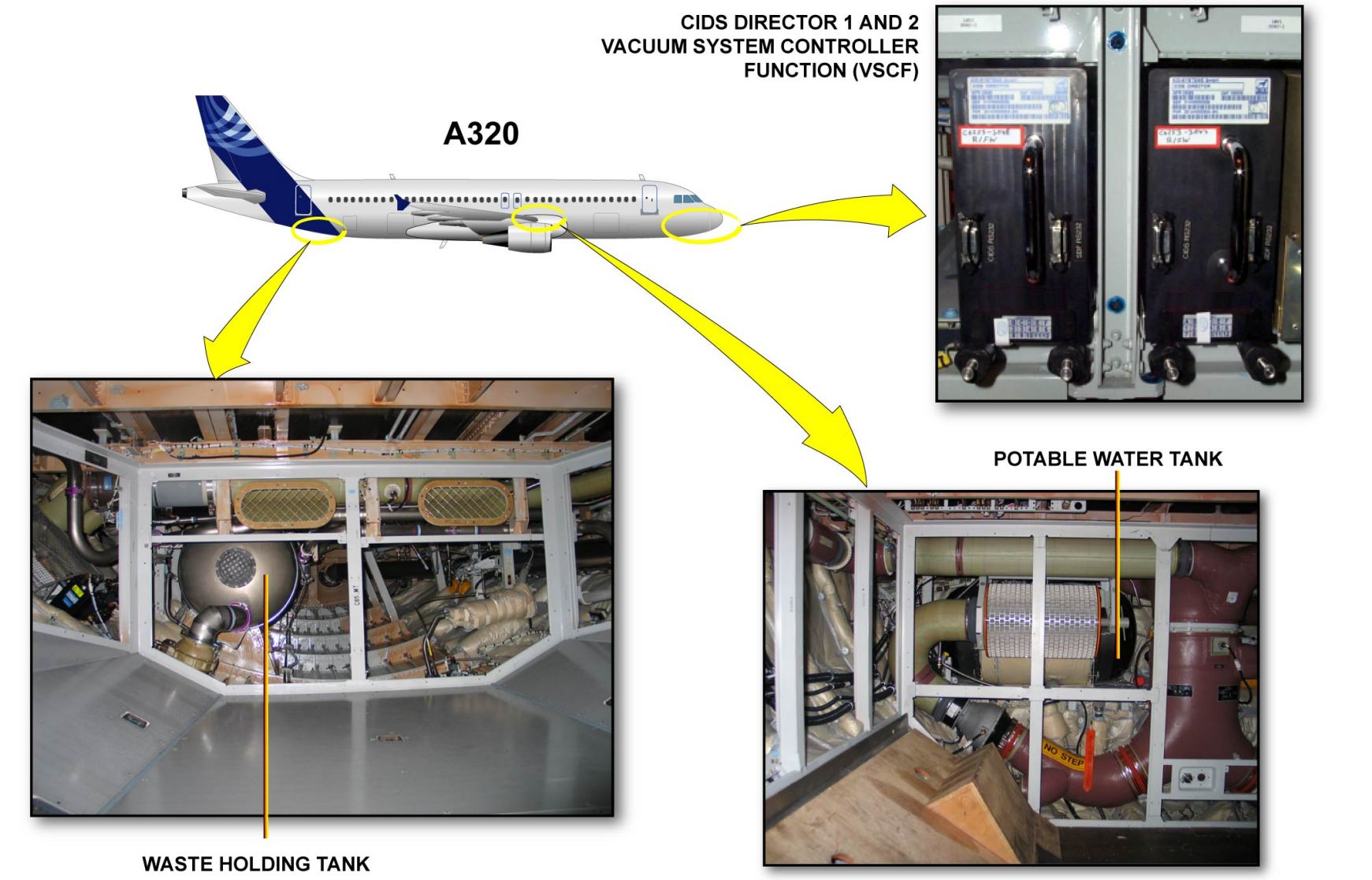
WATER/WASTE SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION

The waste holding tank is installed in the aft fuselage on the RH side.
The VSCF integrated in the CIDS is installed in the avionics compartment.

A320

The A320 potable water tank is installed in the lower RH fuselage behind the forward cargo compartment.



COMPONENT LOCATION - A320

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

A318/A319/A321

The A318, A319 and A321 potable water tank is installed in the lower LH aft fuselage beside the waste holding tank.

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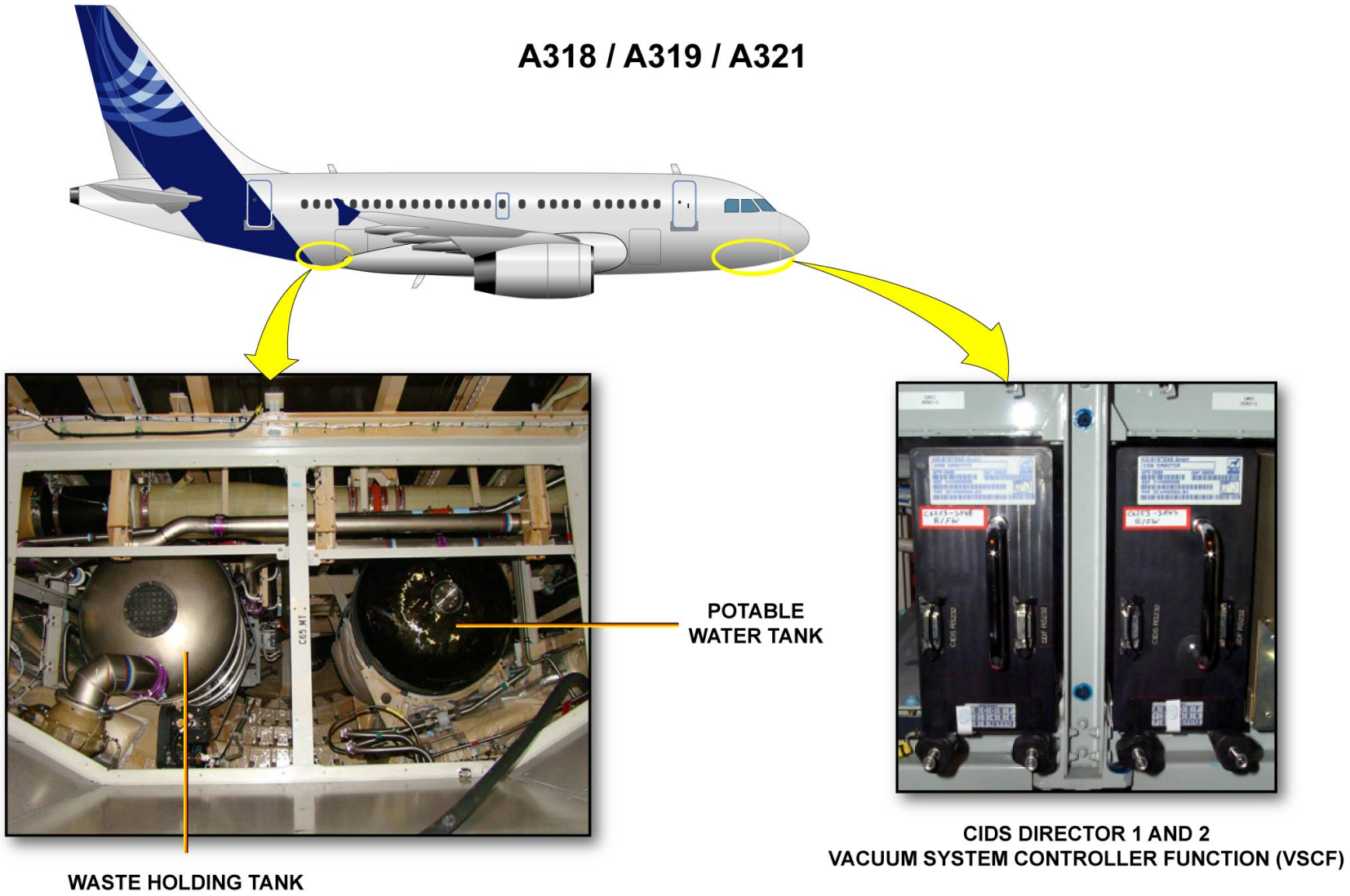
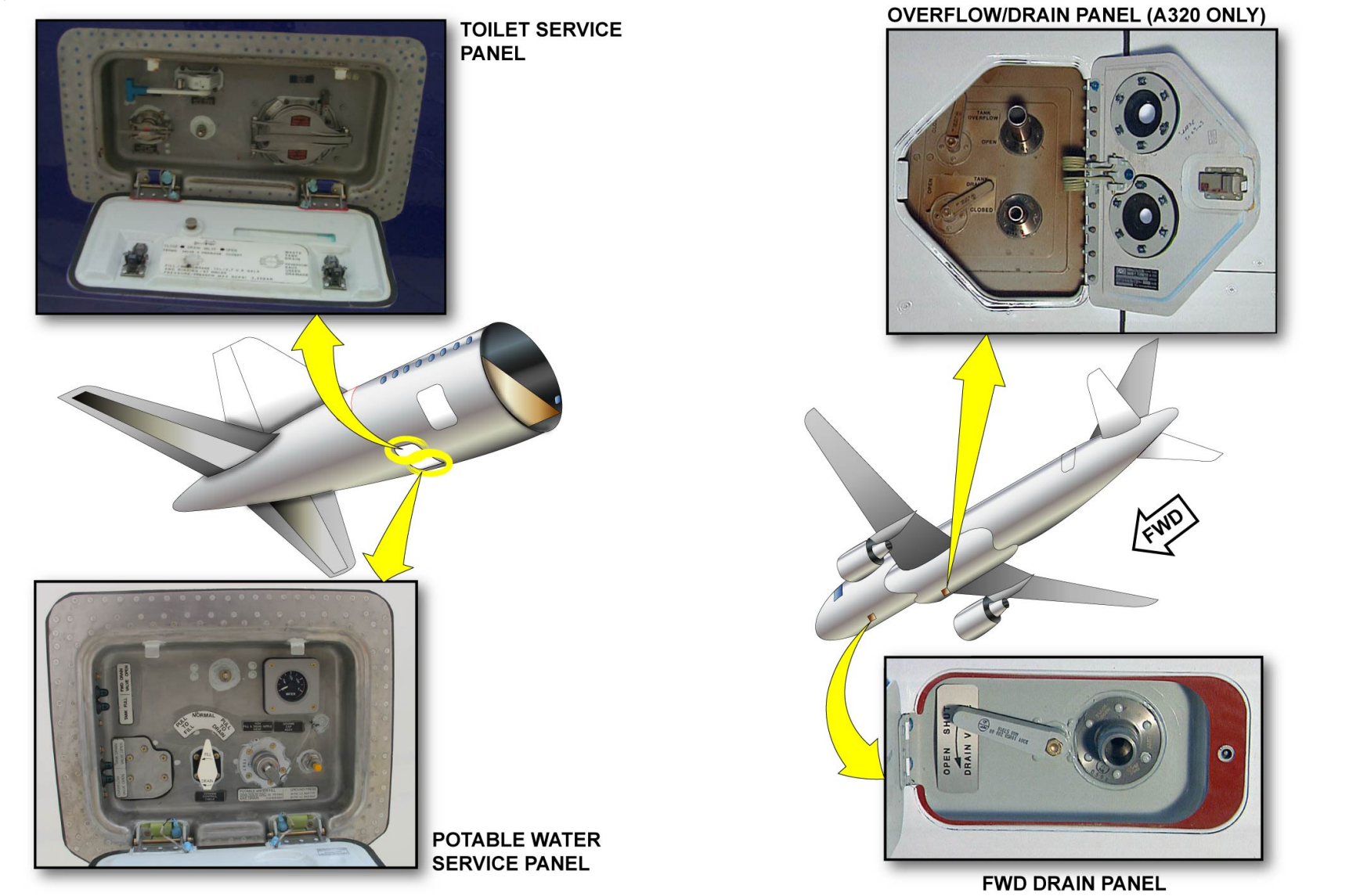


COMPONENT LOCATION - A318/A319/A321

WATER/WASTE SYSTEM COMPONENT LOCATION (2)

SERVICE PANEL LOCATION

The potable water service panel is installed in the rear lower fuselage on the LH side.
It is used to fill and drain the potable water tank.
The A320 has two drain panels, installed in the lower part of the fuselage.
The A318, A319 and A321 have one drain panel, installed in the lower part of the fuselage.
The toilet service panel is installed in the rear lower fuselage on the RH side.



SERVICE PANEL LOCATION

POTABLE WATER SYSTEM D/O (3)

STORAGE

The potable water is stored in one tank installed in the pressurized underfloor area of the right hand fuselage, aft of the forward cargo compartment. The potable water tank has a capacity of 200 l (53 US gal).

PRESSURIZATION

Pressurization of the system enables water supply from the tank to the necessary service location. Compressed air is tapped from the cross feed line of the engine or APU bleed air. On ground, when the bleed air system is not available, the ground air pressure supply system is used. If installed, the air compressor will supply air when bleed is not available. During servicing, the overflow valve is used to depressurize the potable water tank.

DISTRIBUTION

Potable water from the water tank is supplied through a system of distribution lines, which are routed below the passenger compartment floor. A part of the forward distribution line goes through a hose for added protection of the avionics equipment. The potable water distribution lines are insulated and electrically heated to prevent ice formation in and around the lines. Each lavatory and each galley have an individual and manual shutoff valve.

HEATING

A water heater is installed under the wash basin inside the sanitary unit cabinet. If the quantity transmitter detects a low level into the water tank, it cuts the electrical supply of the water heater. A thermostat allows the water temperature to be maintained between 45 °C (113 °F) and 48 °C (118,4 °F). An over temperature safety device protects the heating element.

INDICATING

The quantity indication system indicates how much water is available in the potable water tank. The quantity transmitter transmits the signal to the indicator on the water service panel. It also sends the information to a Decoder/Encoder Unit (DEU) B, which in turn interfaces with the active Cabin Intercommunication Data System (CIDS) director to display on the Flight Attendant Panel (FAP) the water tank contents in percentage of volume. The TANK FULL light on the service panel comes on when the tank is full.

FILLING

The Filling is achieved through a fill/drain valve operated by the fill/drain control handle on the potable water service panel. The fill/drain control handle simultaneously opens the electrically motorized overflow valve for venting. The quantity transmitter sends a tank-full signal to close the fill/drain valve automatically. Manual operation is possible via control handles dedicated to each valve. Maximum permissible pressure to fill the potable water tank is 50 psi (3.4 bars).

CAUTION: WITHOUT ELECTRICAL POWER YOU MUST OPEN THE OVERFLOW VALVE MANUALLY PRIOR TO THE FILLING TO PREVENT WATER SPILLAGE IN THE CABIN.

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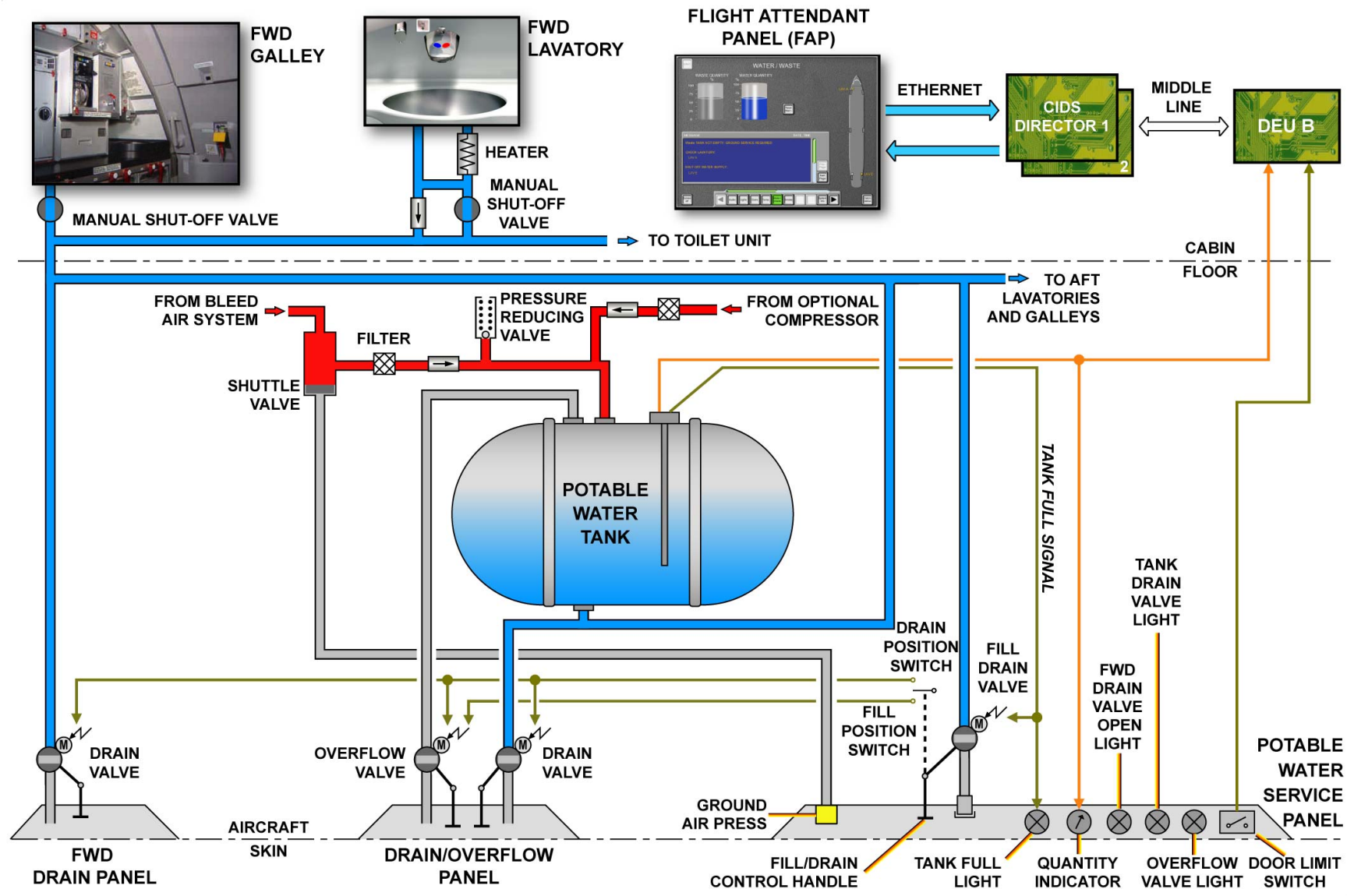

STORAGE ... FILLING

POTABLE WATER SYSTEM D/O (3)

FILLING (continued)

OPERATION

The tank is empty, all valves are closed and there are no indicator lights.
The panel door opens, so the system is electrically powered and the FAP water indication page is automatically called. If installed the air compressor will be stopped.
The Fill/Drain control handle is positioned to the fill position and pulled out.
The Fill/Drain valve is mechanically opened.
The Fill position switch is actived.
The Fill position switch sends an electrical signal which will open the overflow valve. The overflow valve light comes ON when the valve is in the open position.
From a ground service cart we'll fill the water tank:
- the system takes on water and tank slowly fills up,
- also the cabin water system is supplied,
- FAP water indication increases.

The tank is full now so the tank sensor will trigger the "Green Tank Full Light" in service panel, the Fill/Drain valve returns to closed, also the overflow valve will close and the overflow valve light will go OFF when the valve is closed again.

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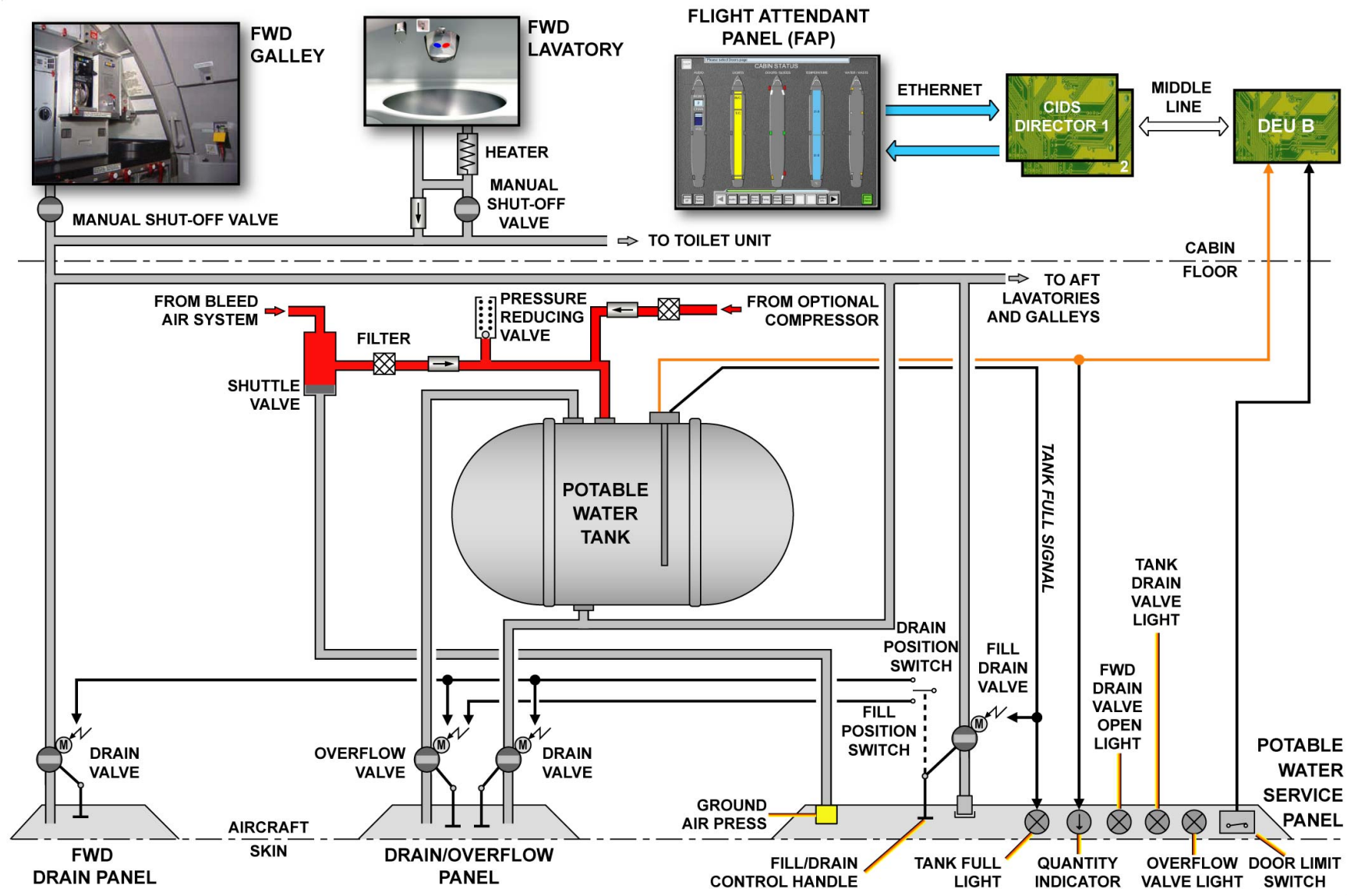
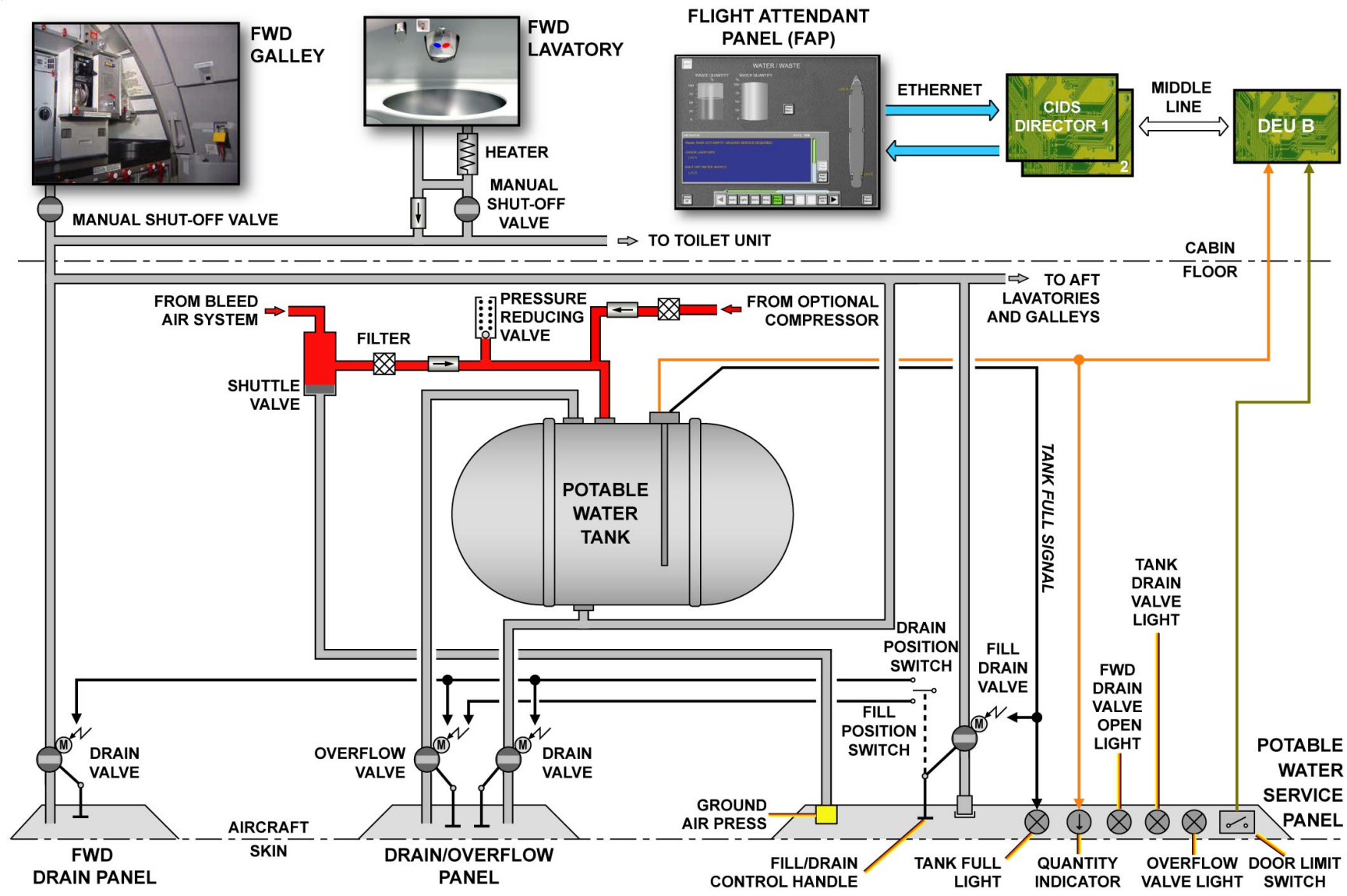
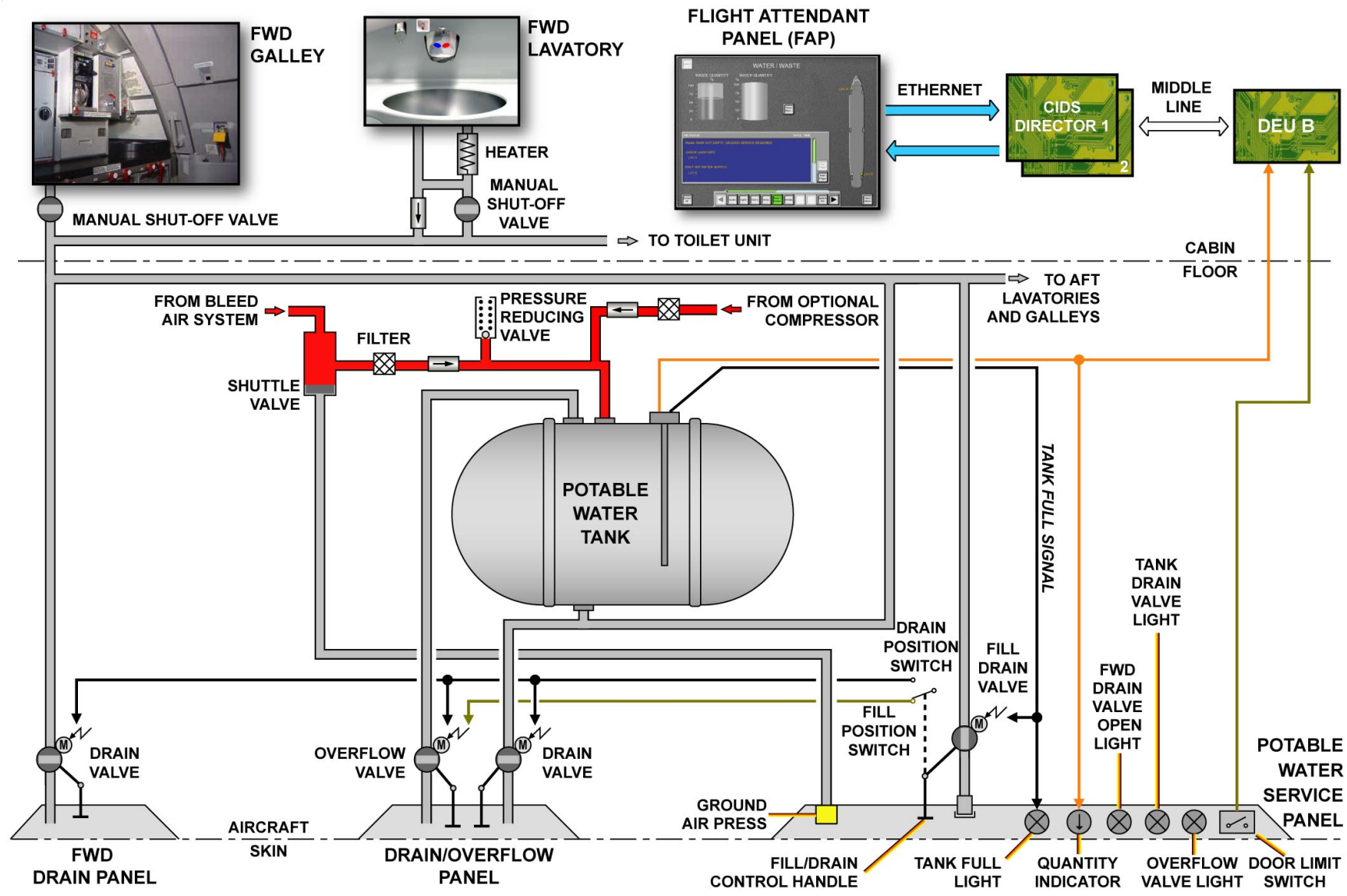


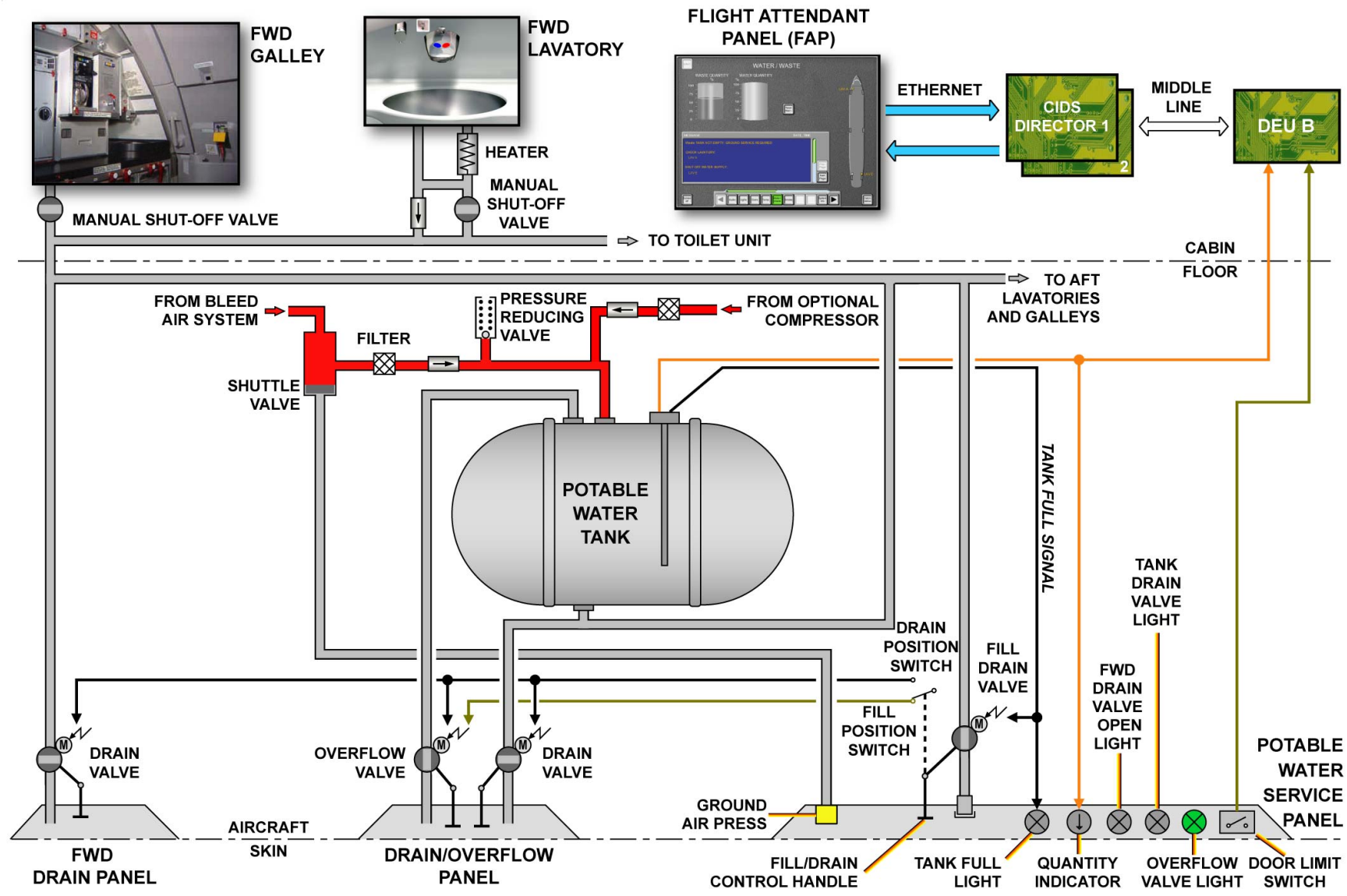
FILLING - OPERATION



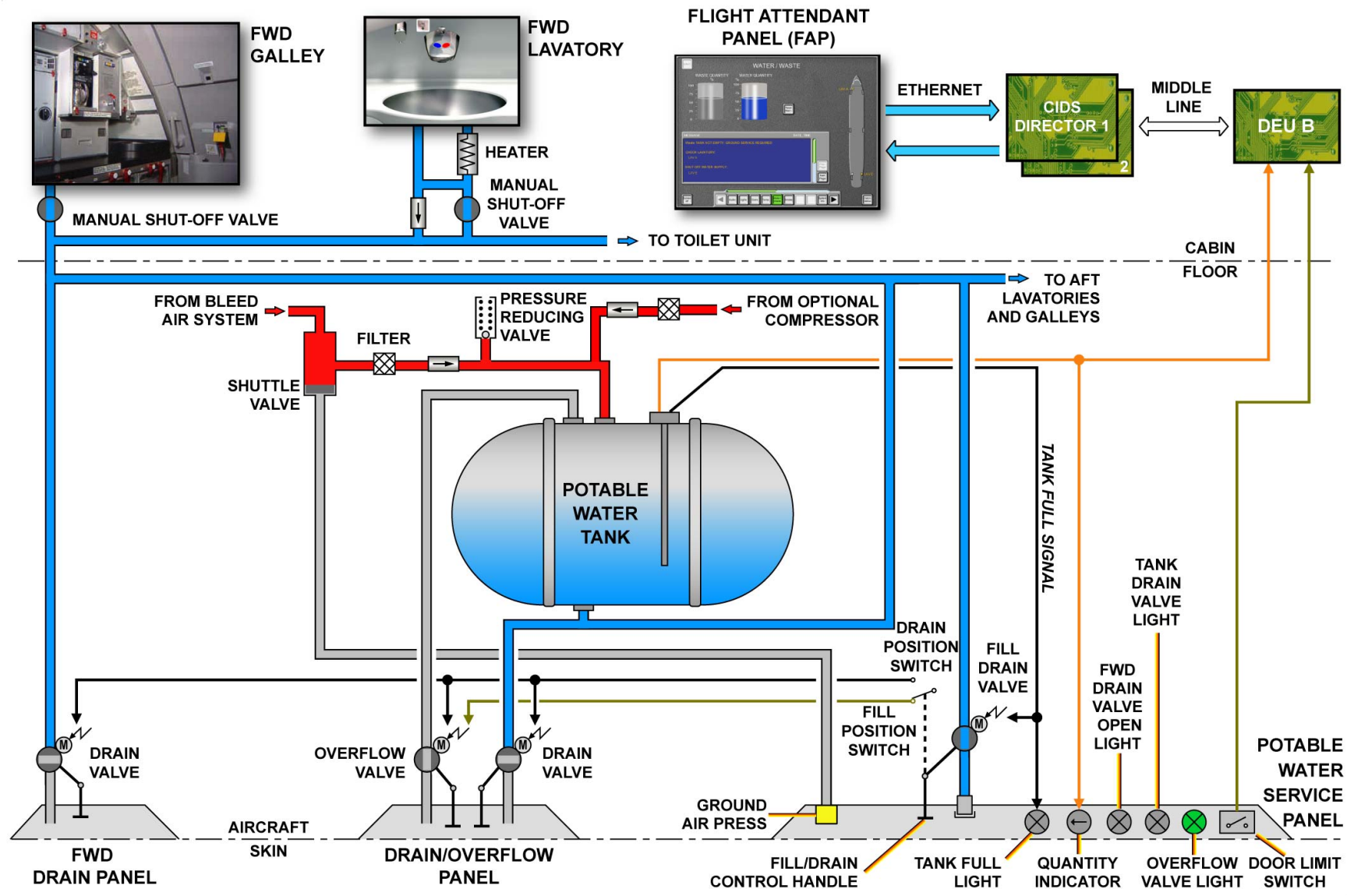
FILLING - OPERATION



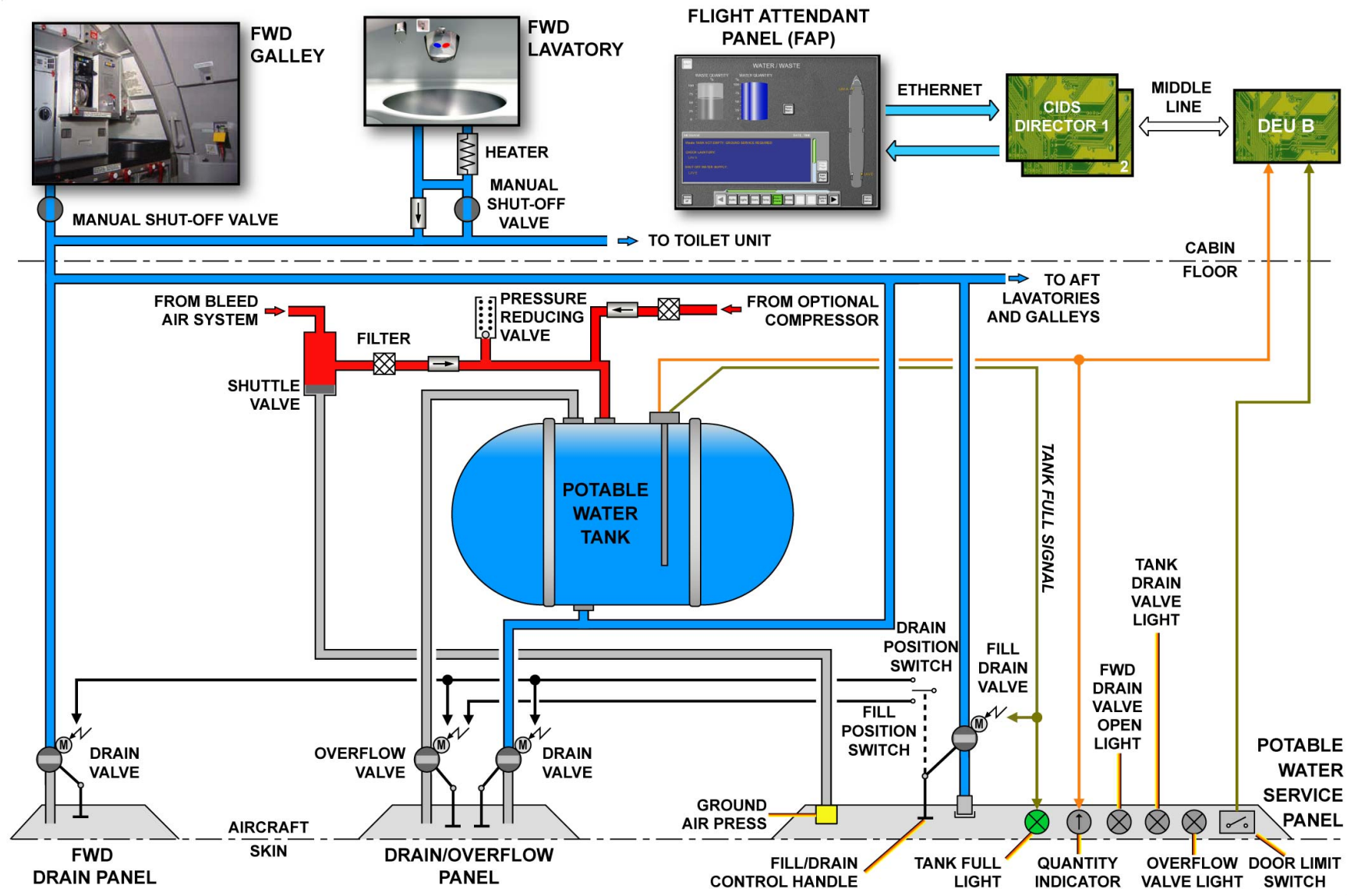
FILLING - OPERATION



FILLING - OPERATION



FILLING - OPERATION



FILLING - OPERATION

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POTABLE WATER SYSTEM D/O (3)

DRAINING

The draining operation is achieved through the fill/drain valve and three motorized valves, two drain valves and the overflow valve. Their opening and closing is controlled via electrical signals from the manual operated control handle. All valves can also be operated via their related control handle, if no electrical power is available.

OPERATION

For the draining of the potable water tank in this case:
- the tank is full,
- the aircraft is electrically supplied.

But the draining can be done from every level.
The panel door opens, so the system is electrically powered and the FAP water indication page is automatically called.
The Fill/Drain control handle is positioned to the drain position and pulled out.
The Fill/Drain valve is mechanically opened.
The drain position switch is activated.
From the drain position switch an electrical signal will open the overflow valve, the tank drain valve and the FWD drain valve.
In the service panel the "Green FWD Drain Valve Open Light", the "Tank Drain Valve Light", and the "Green Overflow Valve Light" come on.
Due to the opening of all valves, the system will be drained. Most of the water will come from the tank drain and only a small amount from fill/drain and FWD drain valve.
In the service panel the "Tank Full Light" goes off.
The water quantity in the tank and the FAP water indication decrease.
The tank is empty now, the tank sensor will trigger, so the water heater goes to off.
The Fill/Drain control handle is pushed to valve closed position.
All valves will close and all lights in the service panel will go off when the valves are closed again.
The potable water service panel is closed so the door limit switch will cut the power.
The FAP water indication page disappears and if installed, the air compressor starts again.

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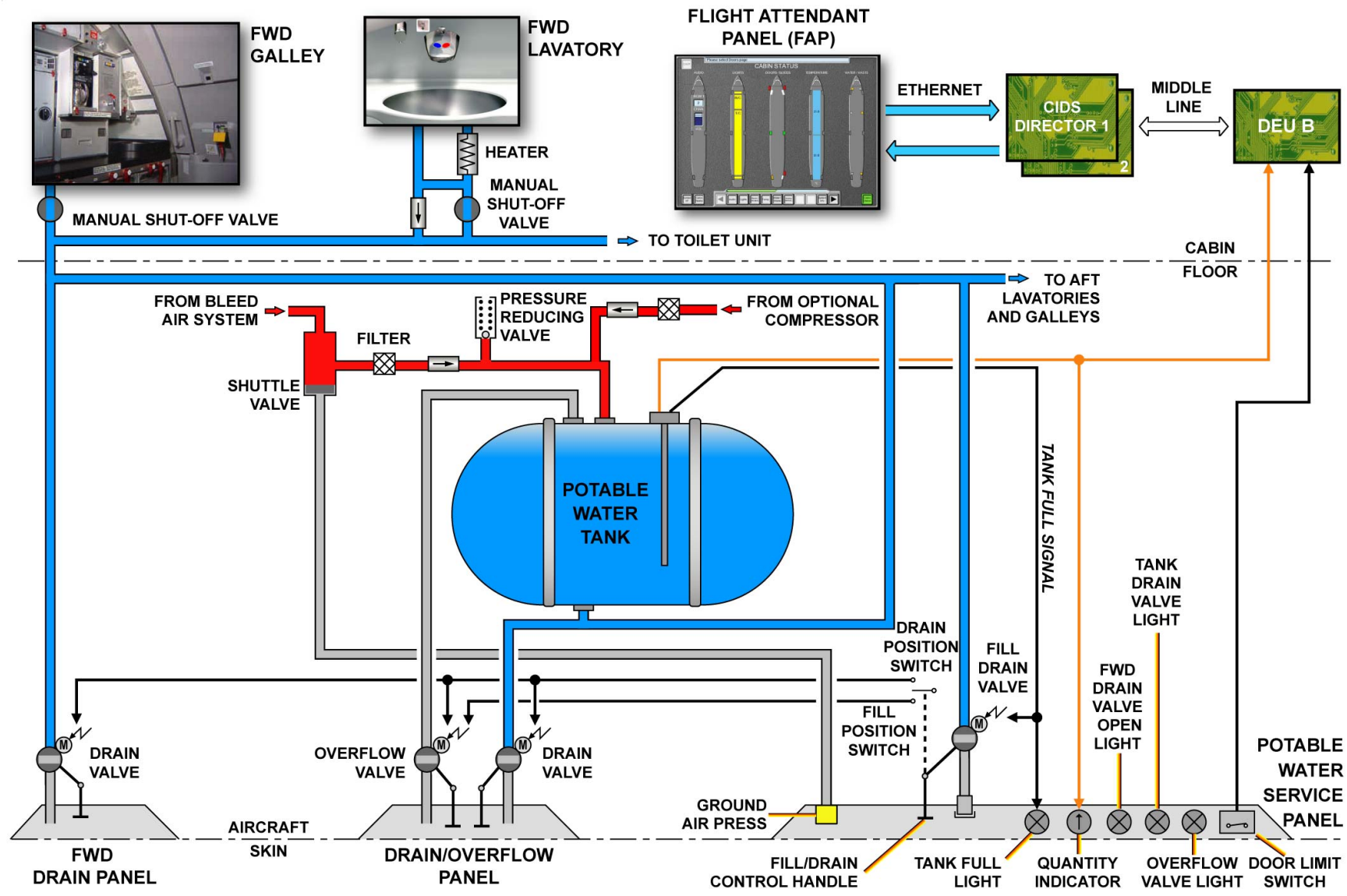
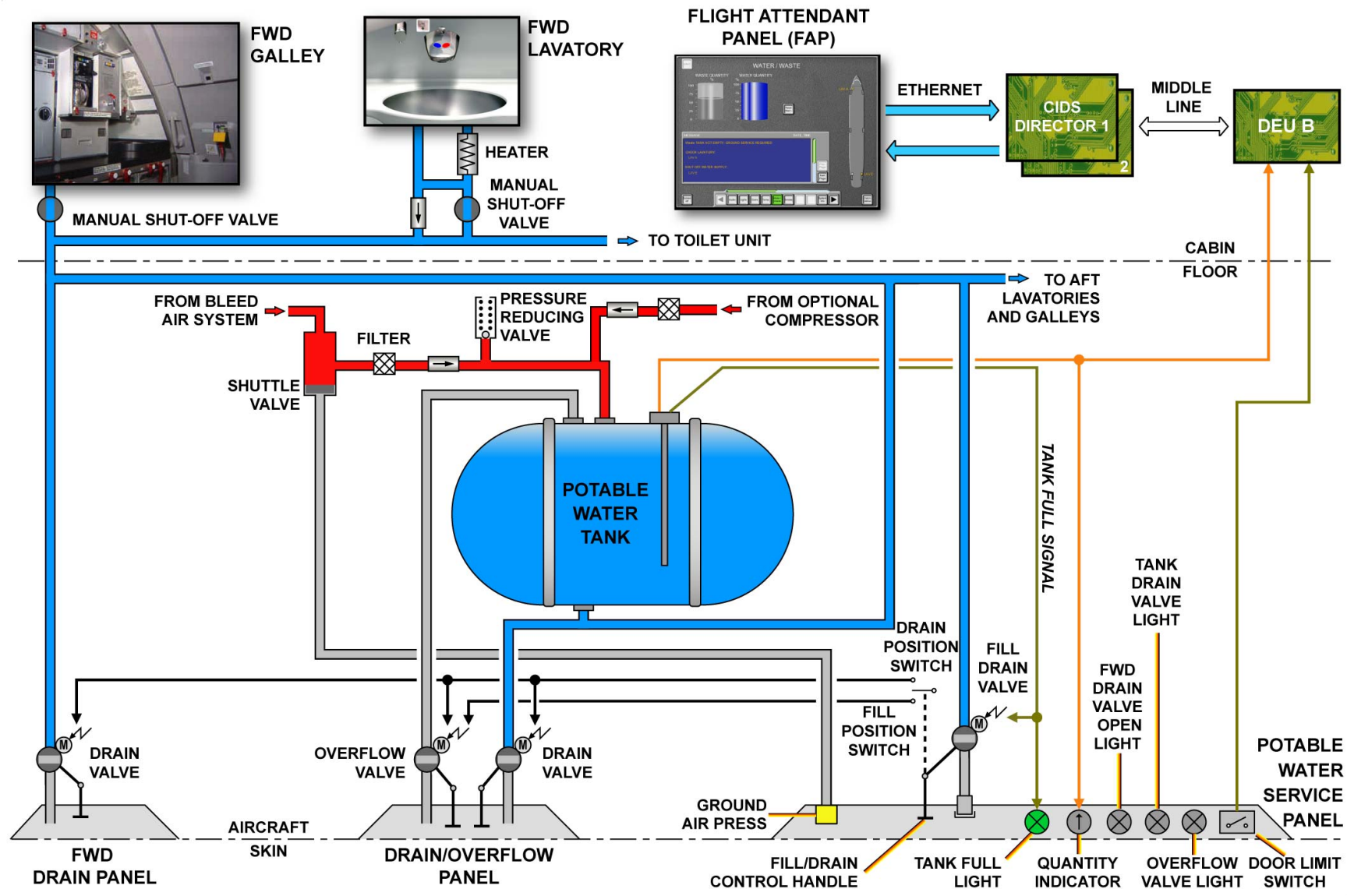


DRAINING - OPERATION



DRAINING - OPERATION

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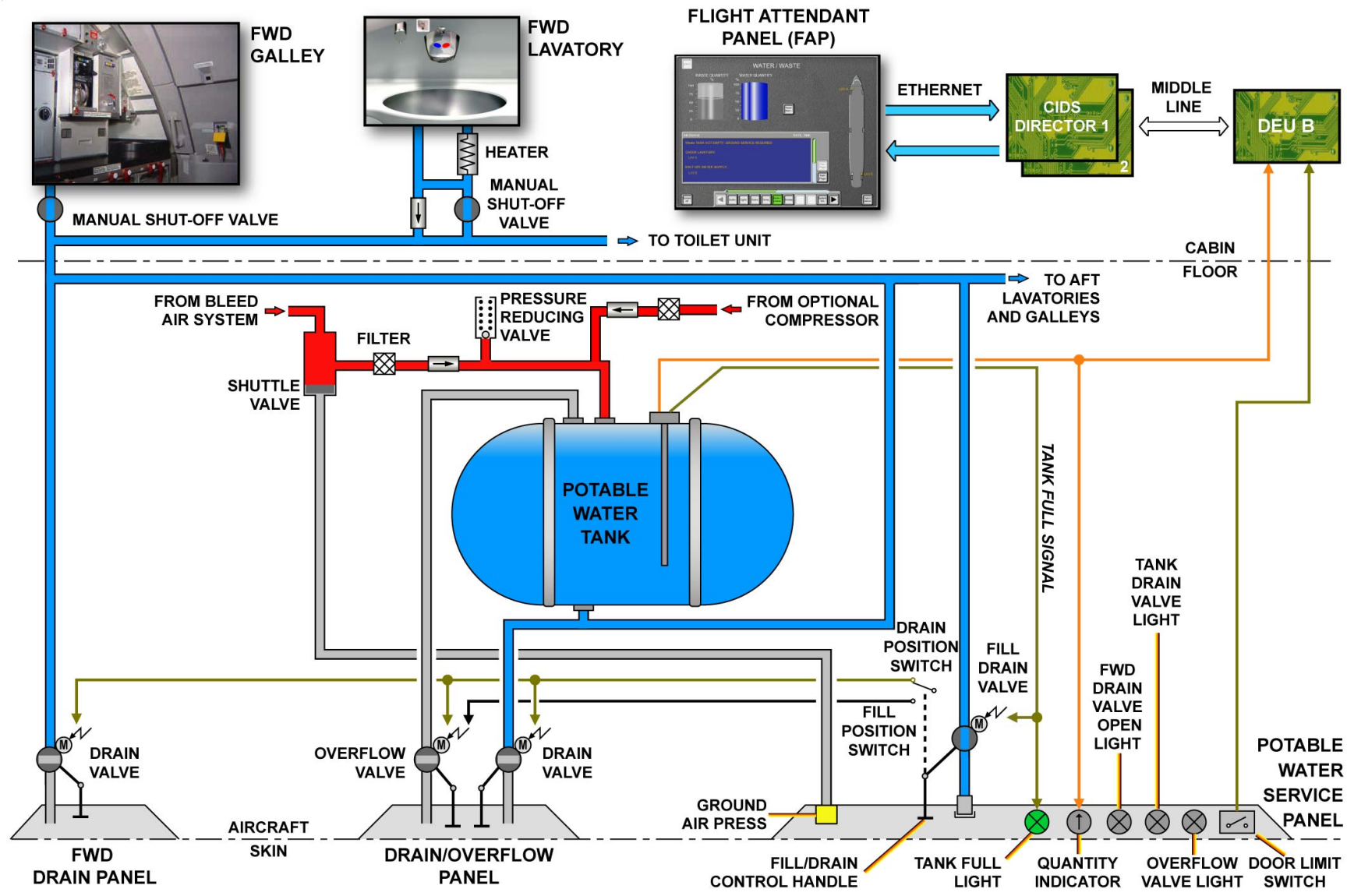
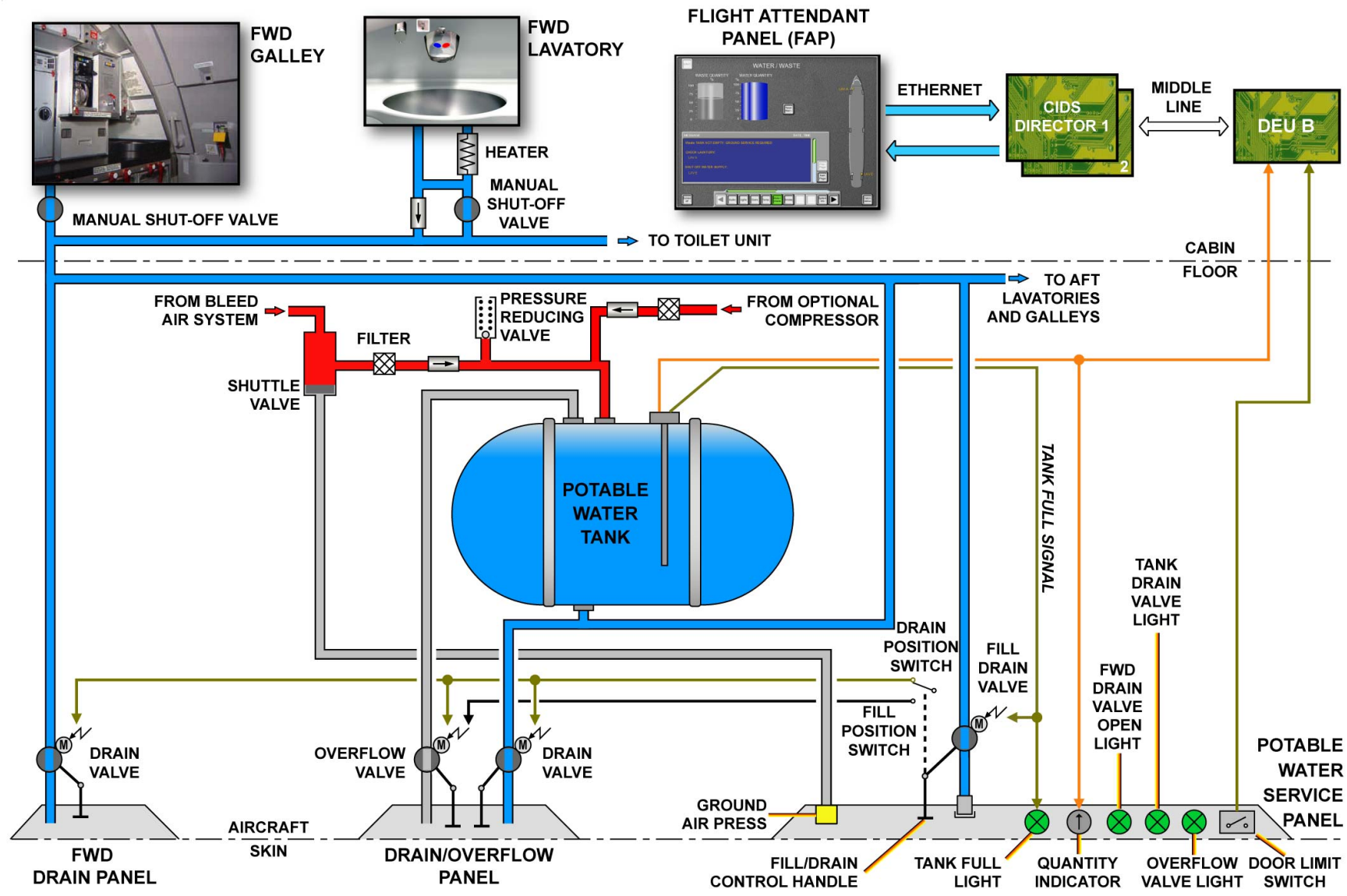


DRAINING - OPERATION



DRAINING - OPERATION

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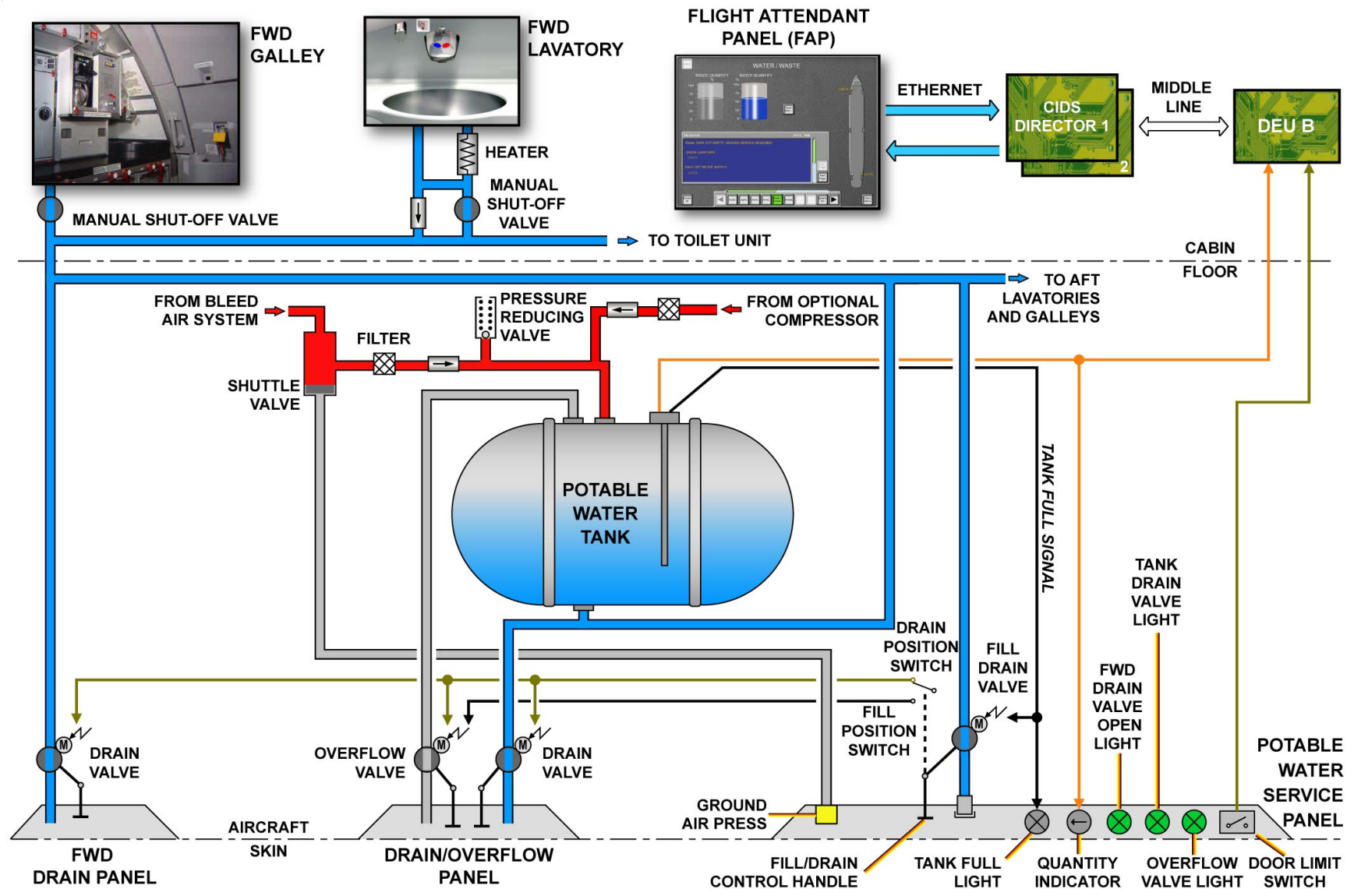

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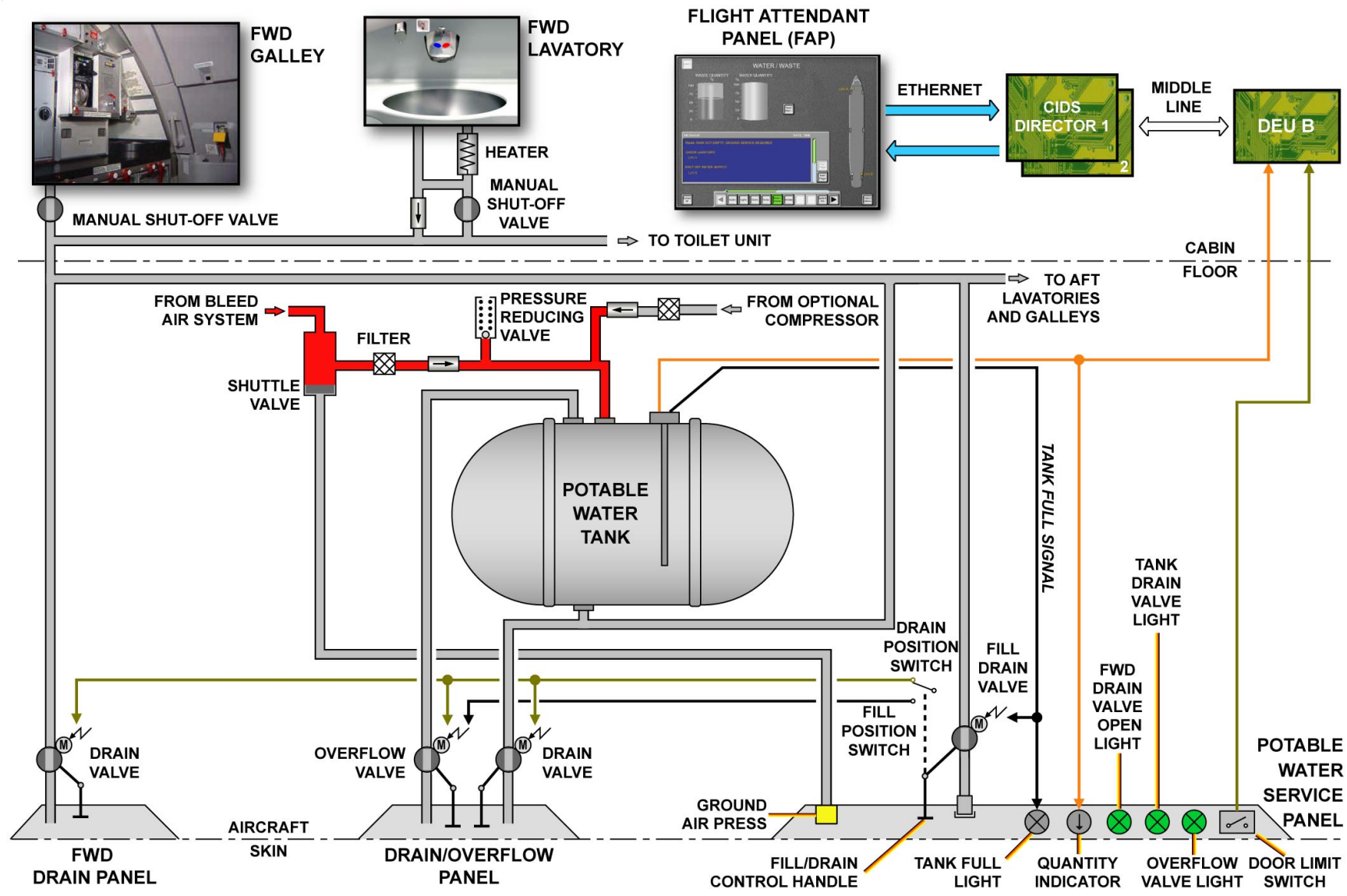

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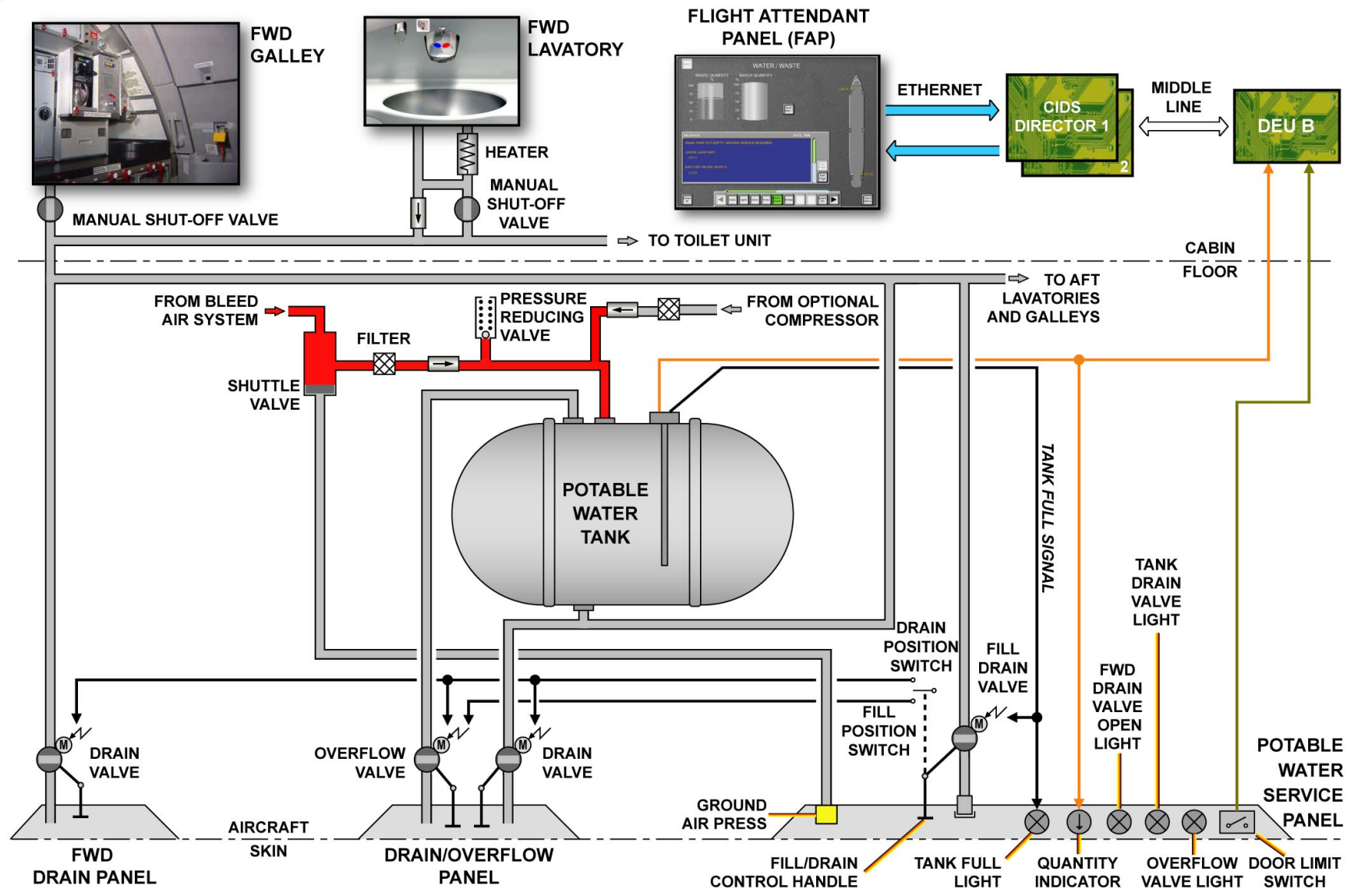

DRAINING - OPERATION

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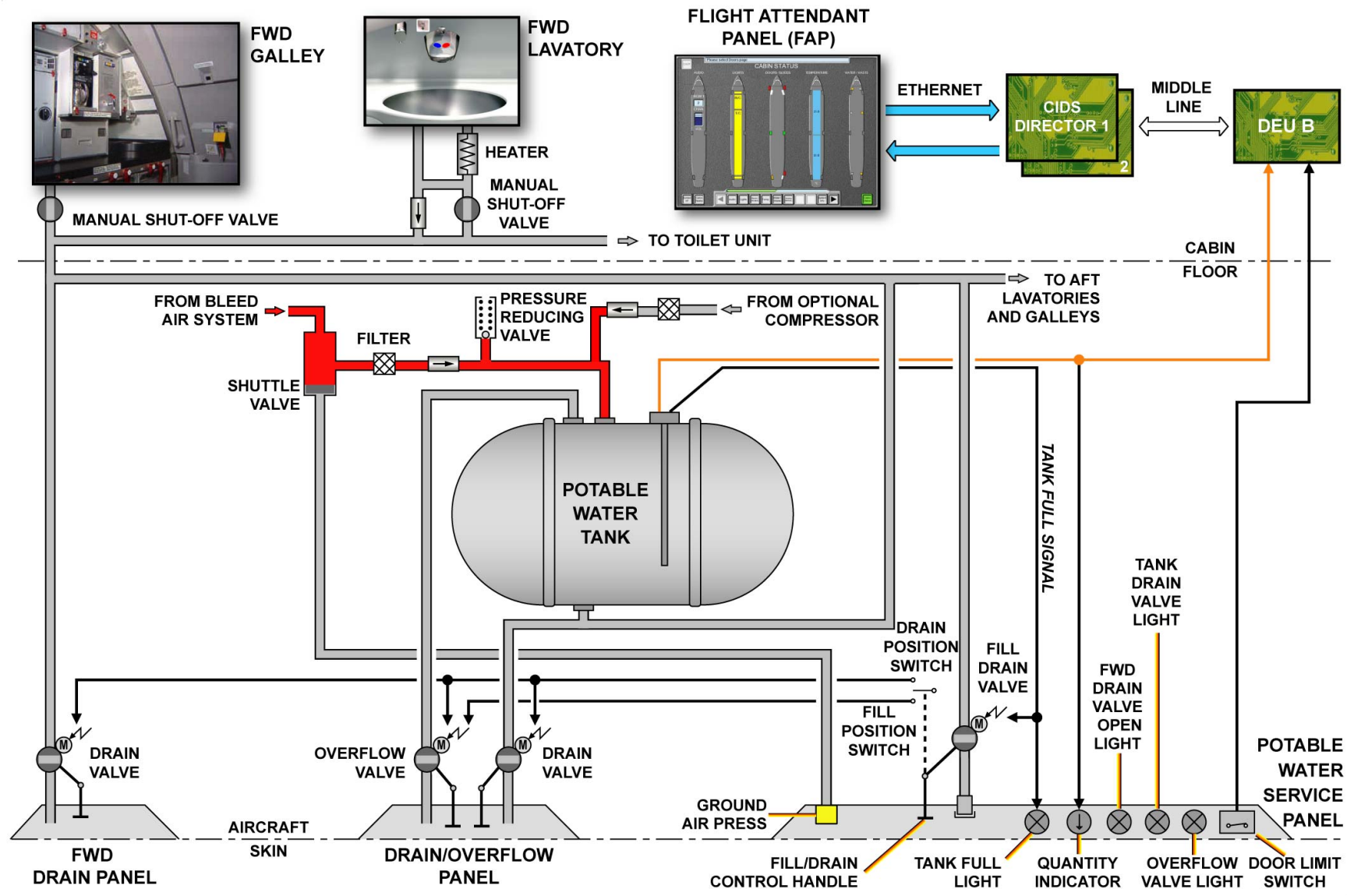

DRAINING - OPERATION

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POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

GENERAL

The potable water controls and indicating includes the display on the Flight Attendant Panel (FAP) and three panels located at the bottom of the aircraft fuselage.

POTABLE WATER SERVICE PANEL

The potable water service panel is installed in the rear left hand side of the fuselage.

DOOR MICROSWITCH

The door microswitch isolates the indicating system when the potable water service panel is closed. When the door is open, the electric motor of the compressor is stopped (if installed). The water and waste page on the FAP will be shown automatically as soon as the service panel door opened.

QUANTITY INDICATOR

The quantity indicator gives the level of the water in the potable water tank.

FILL/DRAIN CONTROL HANDLE

The fill/drain control handle is used to select a filling or draining operation.

FORWARD DRAIN VALVE OPEN LIGHT

The forward drain valve open light comes on when the forward drain valve is open. The light has a lamp press to test facility.

TANK FULL LIGHT

The tank full light comes on when the water tank is full. The light has a lamp press to test facility.

TANK DRAIN VALVE LIGHT

The tank drain valve light comes on when the tank drain valve is open. The light has a lamp press to test facility.

OVERFLOW VALVE LIGHT

The overflow valve light comes on when the overflow valve is open. The light has a lamp press to test facility.

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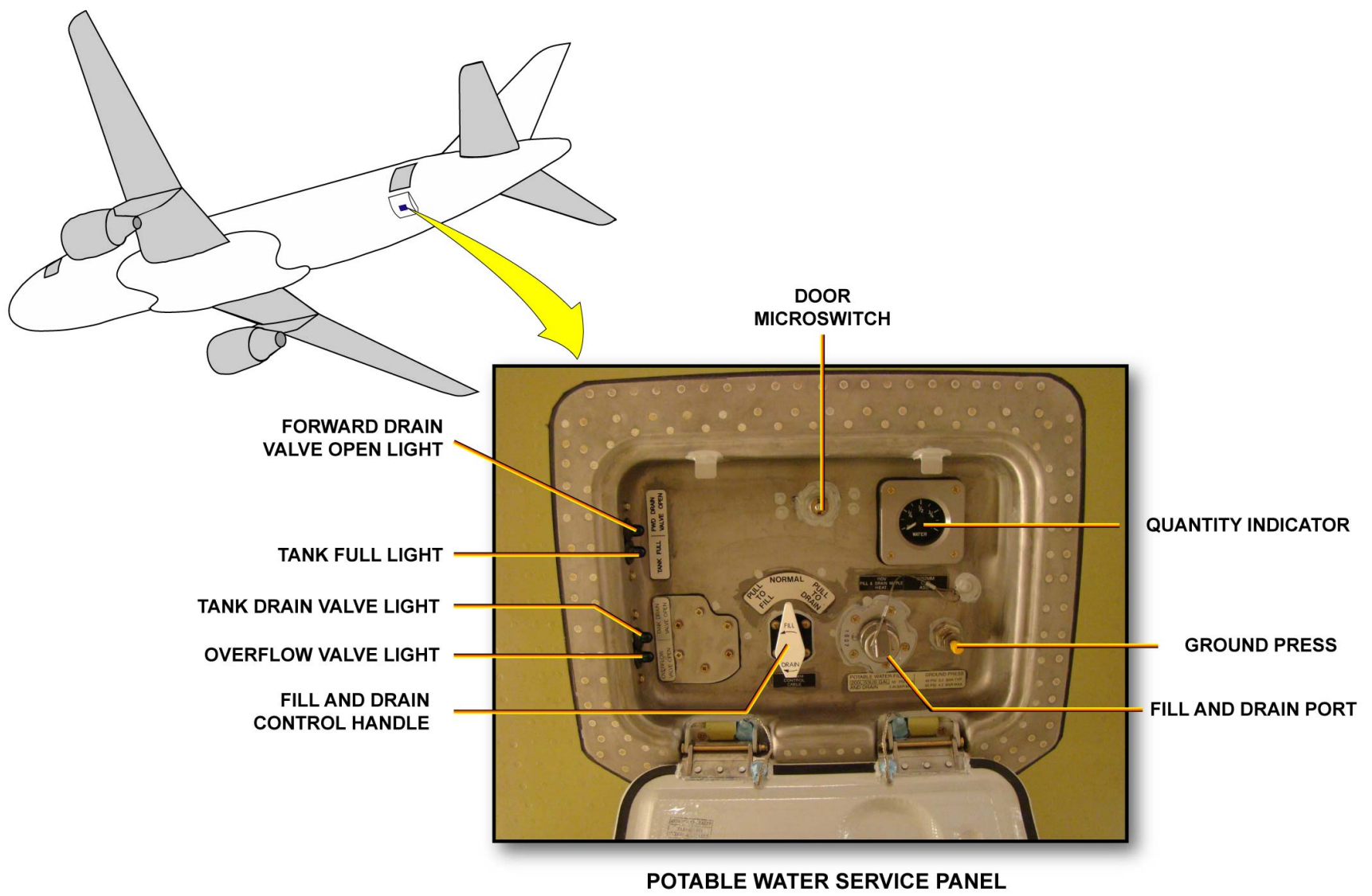
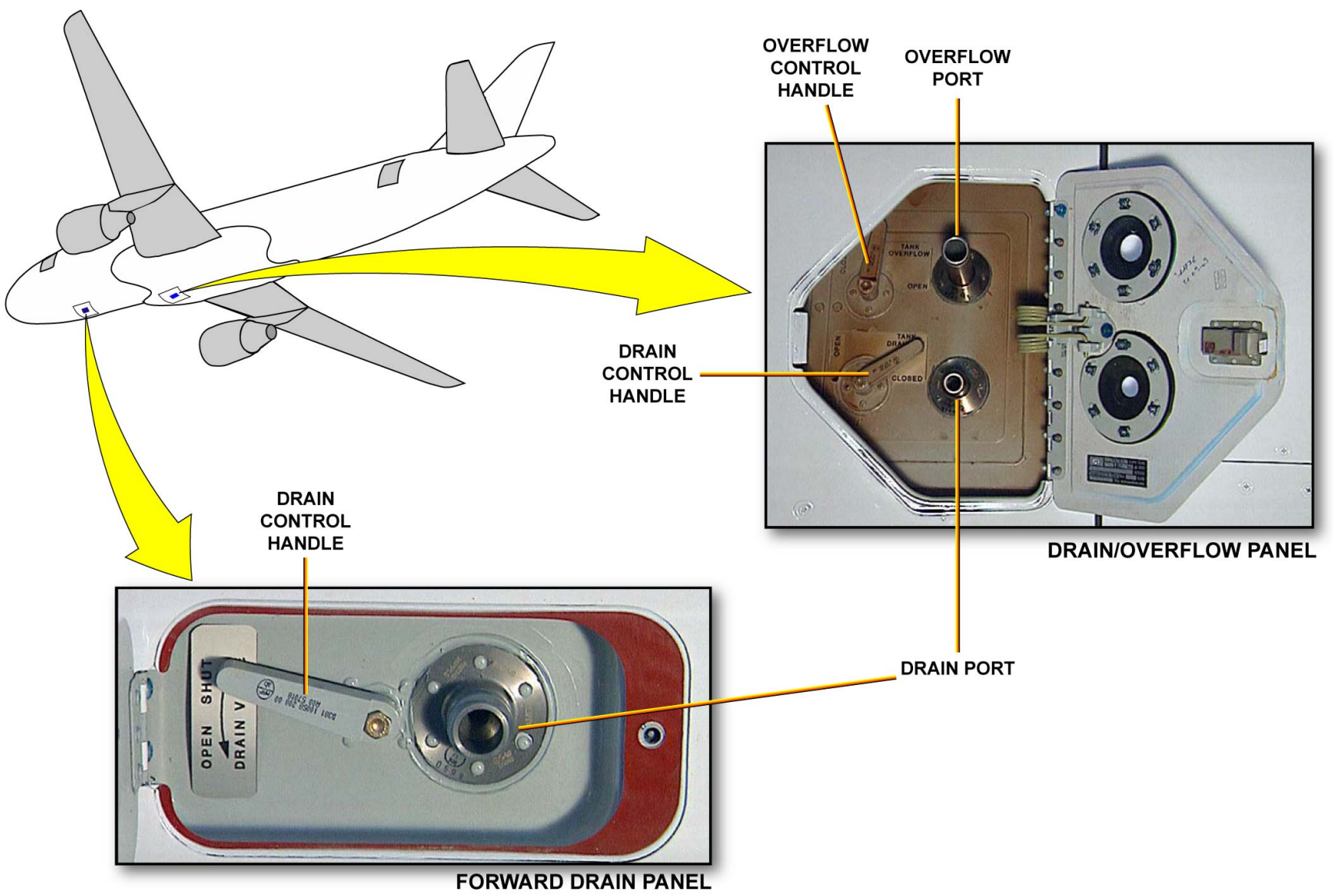


GENERAL & POTABLE WATER SERVICE PANEL

POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

WATER DRAIN PANELS

The forward drain panel and the drain/overflow panel are located in the lower part of the forward fuselage. The drain control handles are used to manually operate the drain valves.



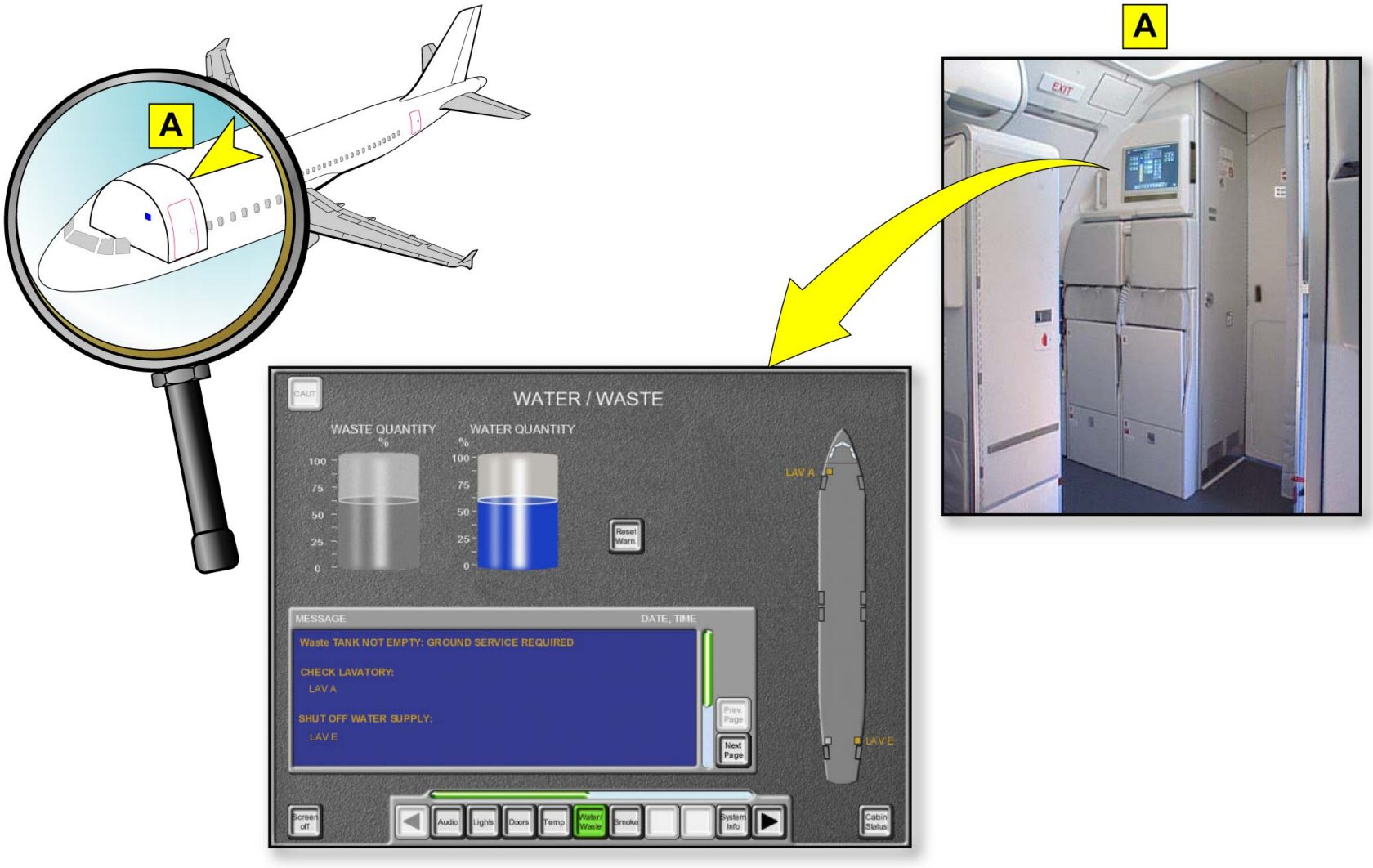
WATER DRAIN PANELS

POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

FAP

The FAP is located in the forward section of the cabin. The FAP displays the potable WATER QUANTITY stored in the potable water tank when the potable water service door is open or the WATER/WASTE page is selected on the FAP.

UGB13131 - U7ST0M0 - UM38I1000000002



FLIGHT ATTENDANT PANEL (FAP)

FAP

POTABLE WATER SYSTEM D/O (3)

STORAGE

The potable water tank with a capacity of 200 l (53 US gal) is installed in the pressurized LH under floor area behind the bulk cargo compartment.

PRESSURIZATION

Compressed air is used to pressurize the system in order to supply water from the tank to the necessary service locations. The compressed air is tapped from the cross feed-line of the engine or APU bleed air and is connected to the water tank air inlet. On ground, when the bleed air system is not available, the ground air pressure supply system is used. If installed, an optional compressor is used for the pressurization in case of bleed air decrease.

DISTRIBUTION

Potable water from the water tank is supplied through a system of distribution lines, which are routed below the passenger compartment floor. A part of the forward distribution line goes through a hose for added protection of the avionics equipment. The potable water distribution lines are insulated and electrically heated to prevent ice formation in and around the lines. Each lavatory and each galley have an individual and manual shutoff valve.

HEATING

In each lavatory, a water heater is installed under the wash basin. If the quantity transmitter detects a low level into the water tank, it cuts the electrical supply of the water heater. A thermostat maintains the water temperature between 45°C (113°F) and 51.7°C (125°F). An over temperature safety device protects the heating element.

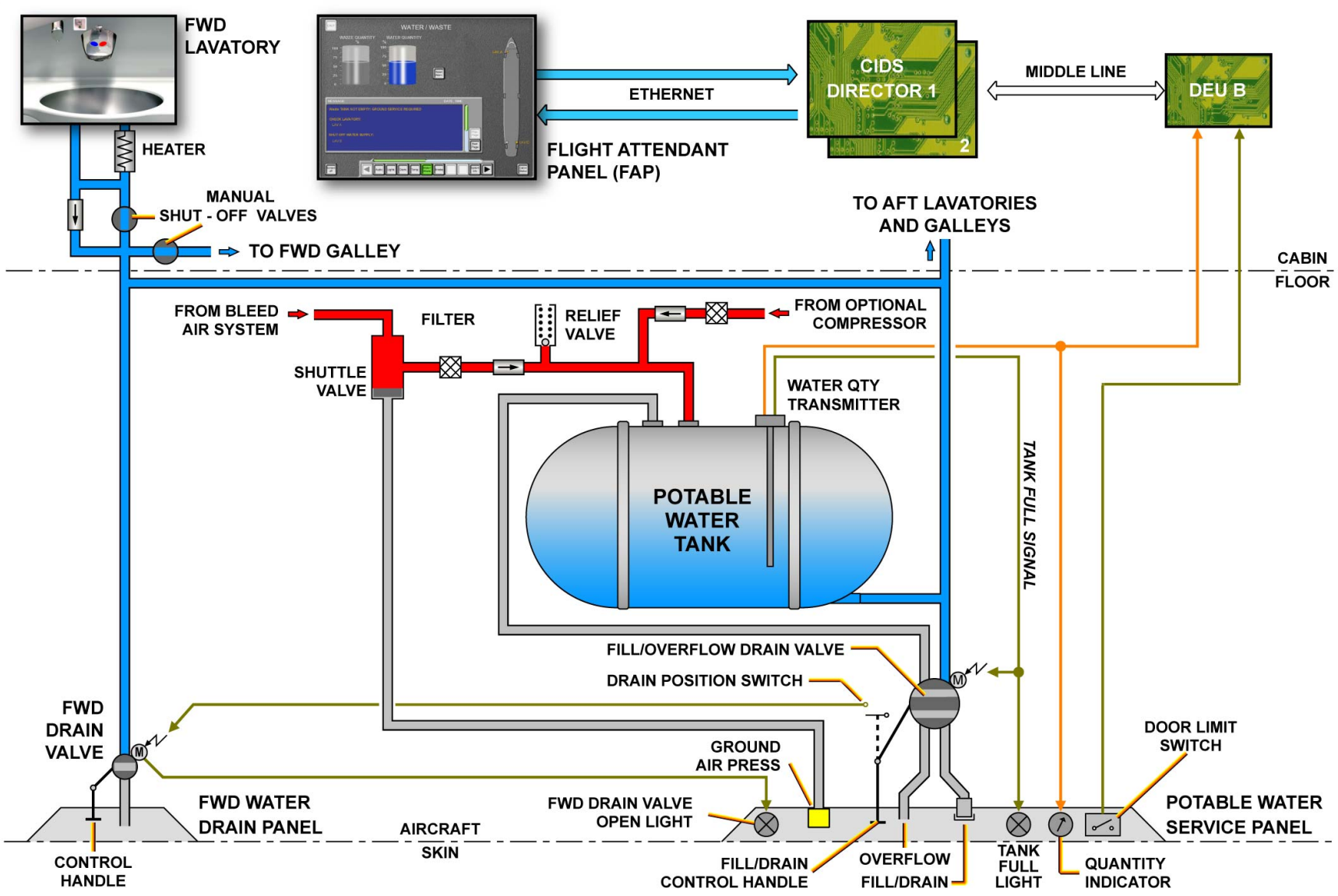
INDICATING

The quantity indication system indicates how much water is available in the potable water tank. The quantity transmitter transmits the signal to the indicator on the water service panel. It also sends the information to a Decoder/Encoder Unit (DEU) B, which in turn interfaces with the active Cabin Intercommunication Data System (CIDS) director to display on the Flight Attendant Panel (FAP) the water tank contents in percentage of volume. The TANK FULL light on the service panel comes on when the tank is full.

SERVICING

The Servicing of the potable water system can be done with or without electrical power. With electrical power, the single fill/drain control handle mechanically operates the fill/overflow drain valve and electrically controls the forward drain valve. Without electrical power, the valves are individually operated by cables. The draining operation is accomplished by opening the fill/overflow drain valve and the forward drain valve. The filling operation is accomplished by opening the fill/overflow drain valve and closing the forward drain valve. When the tank is full, the quantity transmitter sends a signal to close the fill/overflow drain valve automatically.

UGB13131 - U7ST0M0 - UM38D1000000001



STORAGE ... SERVICING

POTABLE WATER SYSTEM D/O (3)

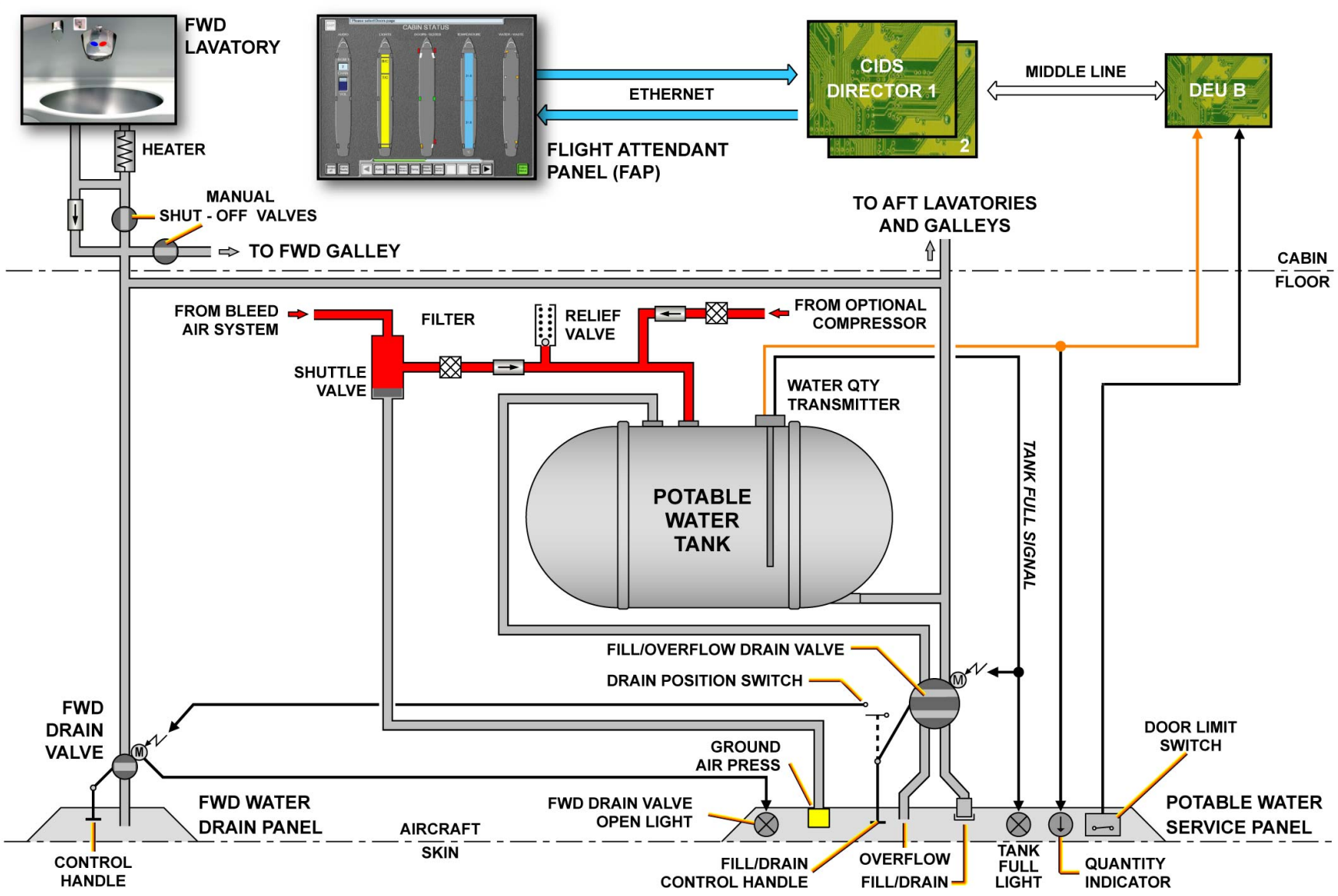
SERVICING (continued)

SYSTEM FILLING

The tank is empty, all valves are closed and there are no indicator lights.
The panel door opens, so the system is electrically powered and the FAP water indication page is automatically called.
The Fill/Drain/Overflow control handle is positioned to the fill position and pulled out.
The Fill/Drain/Overflow valve is mechanically opened.
From a ground service cart we'll fill the water tank:
- the system takes on water and tank slowly fills up,
- also the cabin water system is supplied,
- FAP water indication increases.

The tank is full now so the tank sensor will trigger the "Green Tank Full Light" in service panel and the Fill/Drain/Overflow valve returns to closed.

UGB13131 - U7ST0M0 - UM38D1000000001



SERVICING - SYSTEM FILLING

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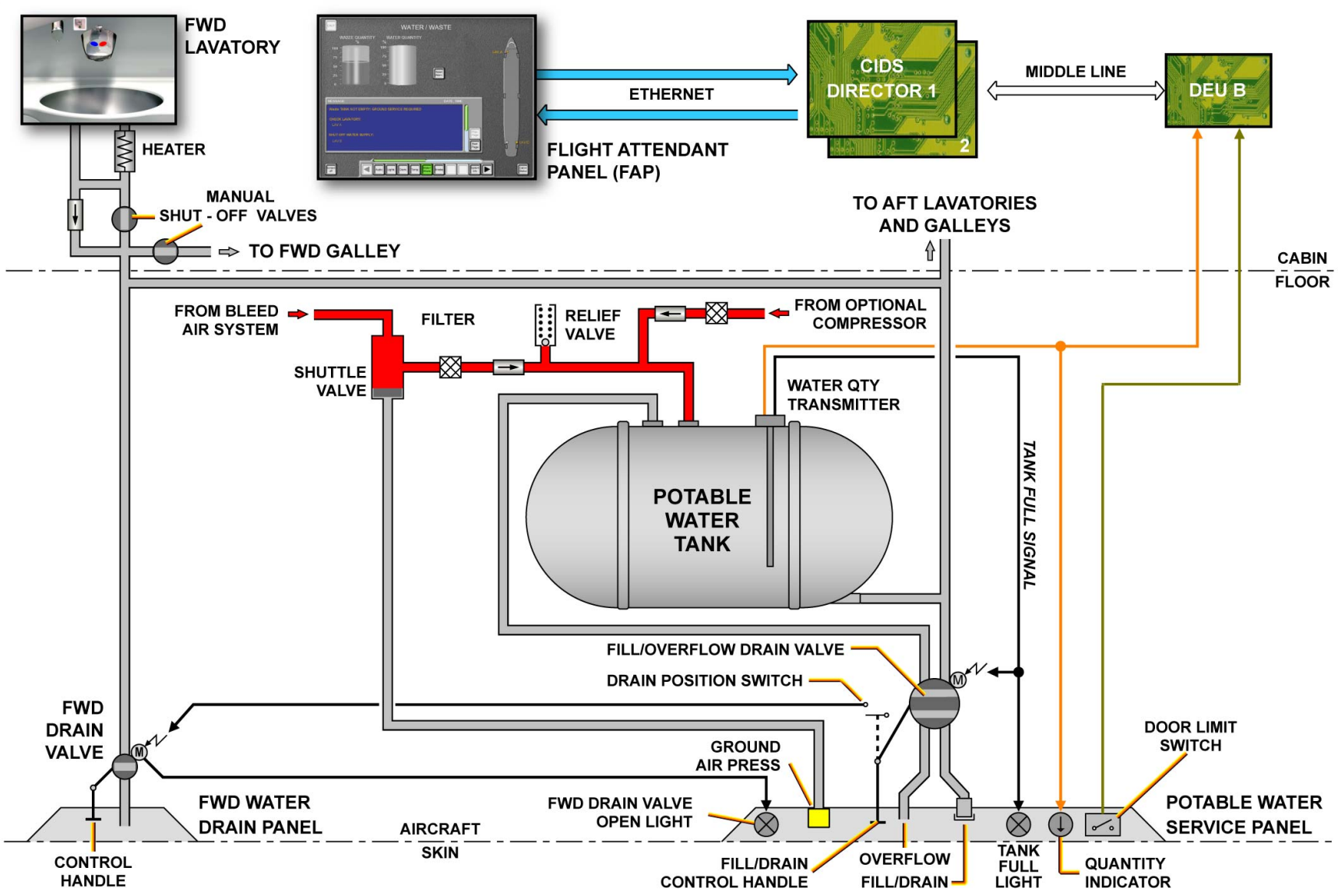

SERVICING - SYSTEM FILLING

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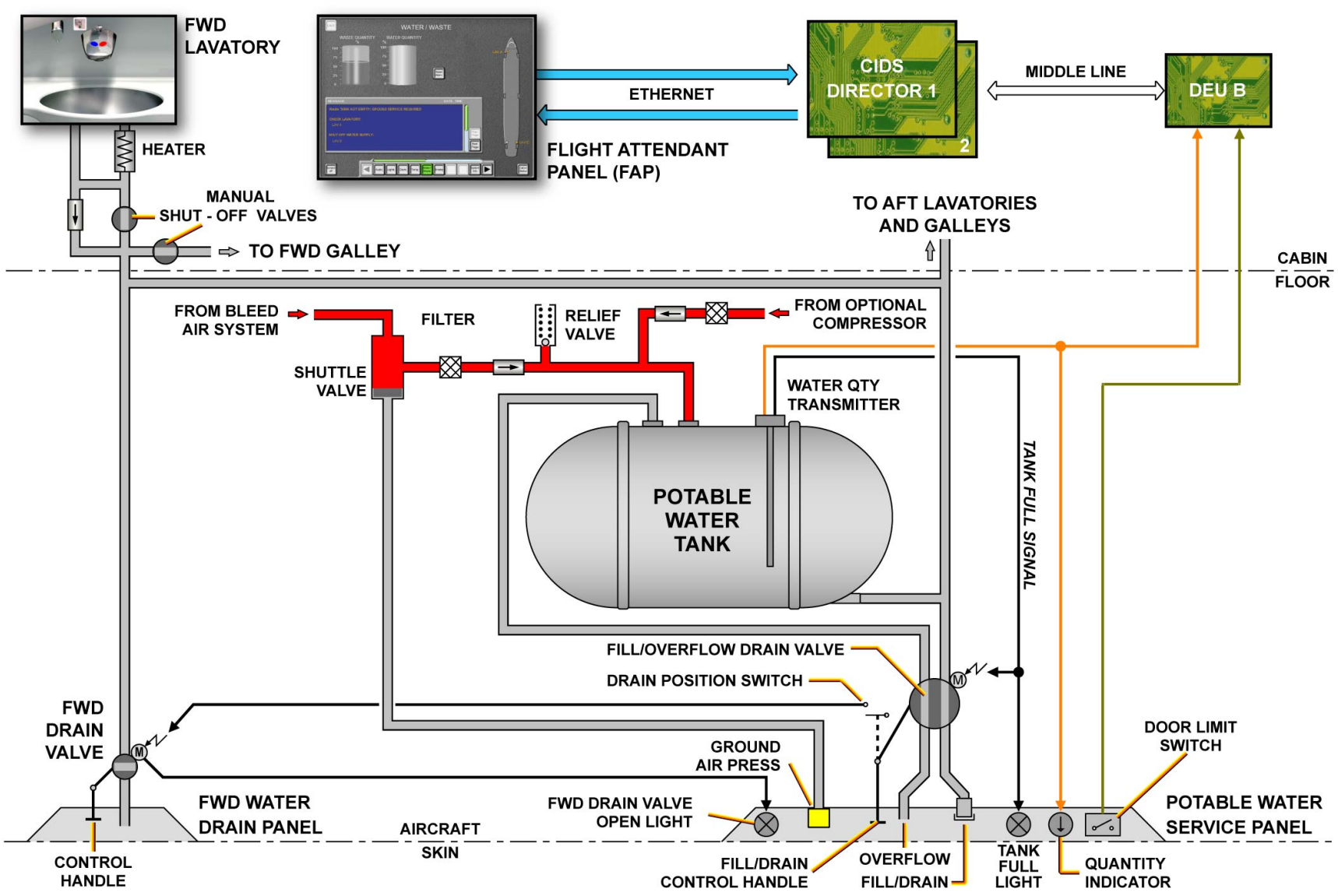

SERVICING - SYSTEM FILLING

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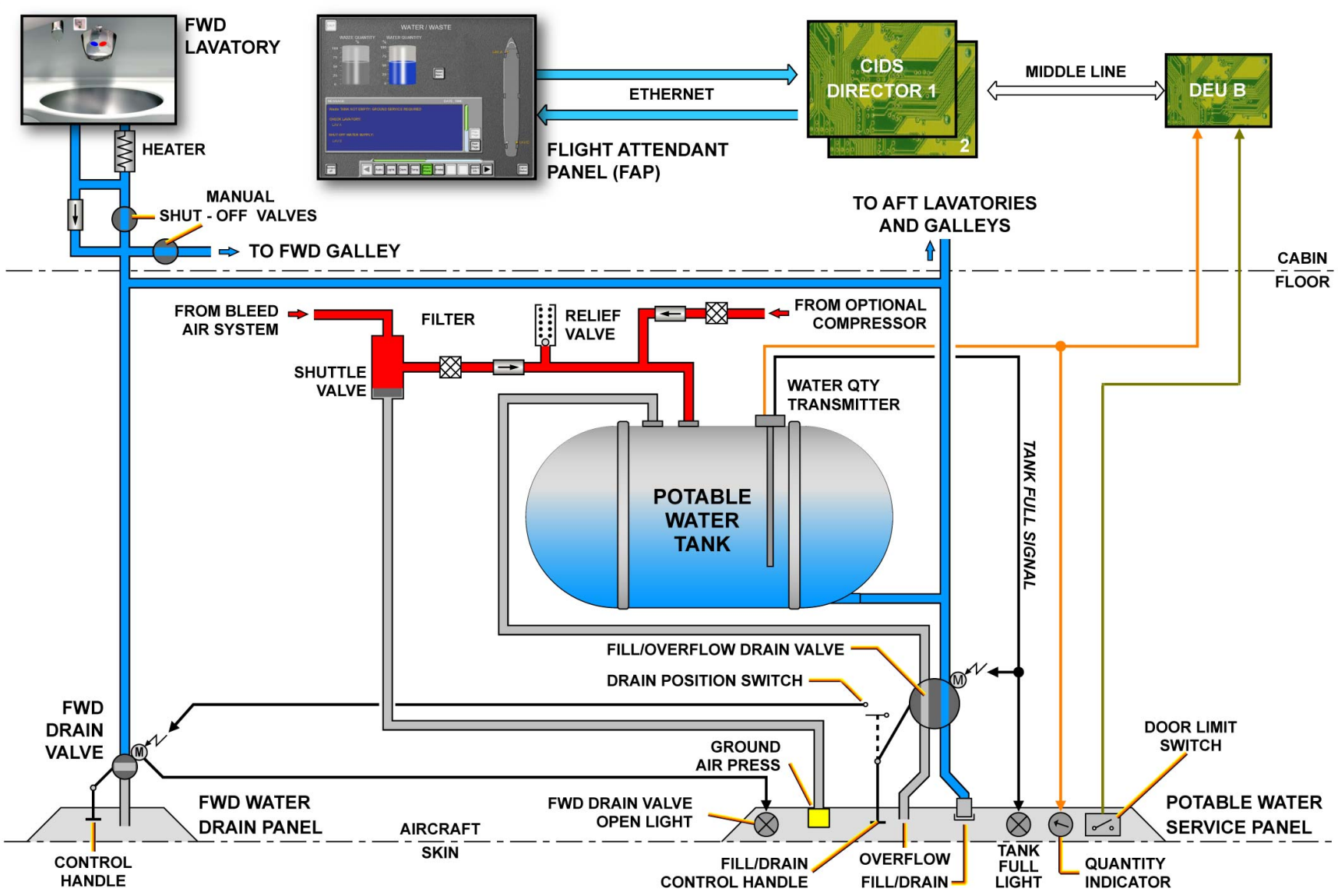
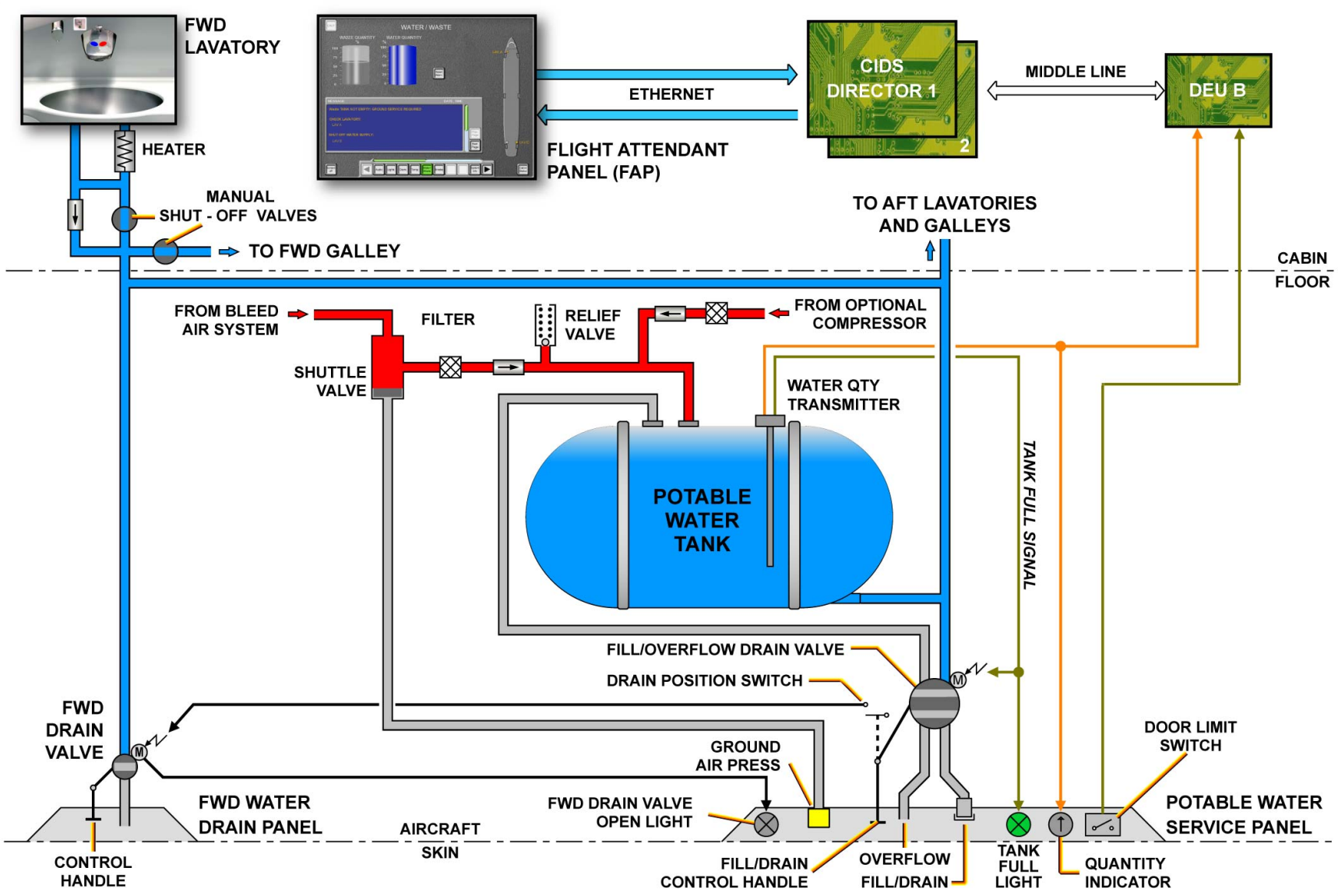


SERVICING - SYSTEM FILLING

UGB13131 - U7ST0M0 - UM38D1000000001



SERVICING - SYSTEM FILLING

UGB13131 - U7ST0M0 - UM38D1000000001

POTABLE WATER SYSTEM D/O (3)

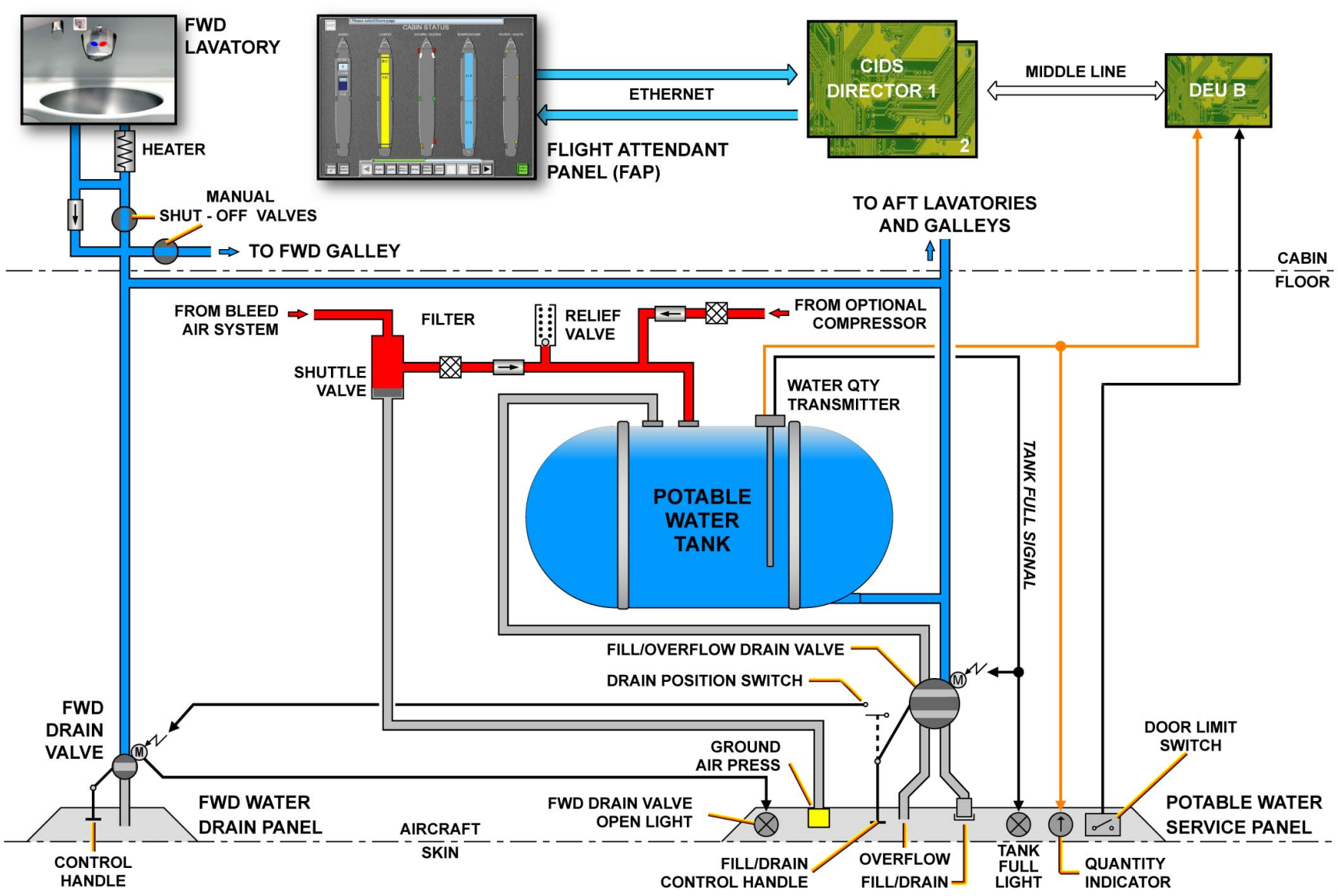
SERVICING (continued)

SYSTEM DRAINING

For the draining of the potable water tank in this case:
- the tank is full,
- the aircraft is electrically supplied.

But the draining can be done from every level.
The panel door opens, so the system is electrically powered and the FAP water indication page is automatically called.
The tank full light comes on.
The Fill/Drain/Overflow control handle is positioned to the drain position and pulled out.
The Fill/Drain/Overflow valve is mechanically opened.
The drain position switch is activated.
From the drain position switch an electrical signal will open the FWD drain valve.
In the service panel the "Green FWD Drain Valve Open Light" comes on.
Due to the opening of all valves, the system will be drained. Most of the water will come from the tank drain and only a small amount from the FWD drain valve.
In the service panel the "Tank Full Light" goes off.
The water quantity in the tank and in the FAP water indication decreases.
The tank is empty now, the tank sensor will trigger, so the water heater goes to off.
The Fill/Drain/Overflow control handle is pushed to valve closed position.
The FWD drain valve will close and all lights in the service panel will be off.
The potable water service panel is closed so the door limit switch will cut the power.
The FAP water indication page disappears and the air compressor will start as soon as the panel door is closed again.

UGB13131 - U7ST0M0 - UM38D1000000001



SERVICING - SYSTEM DRAINING

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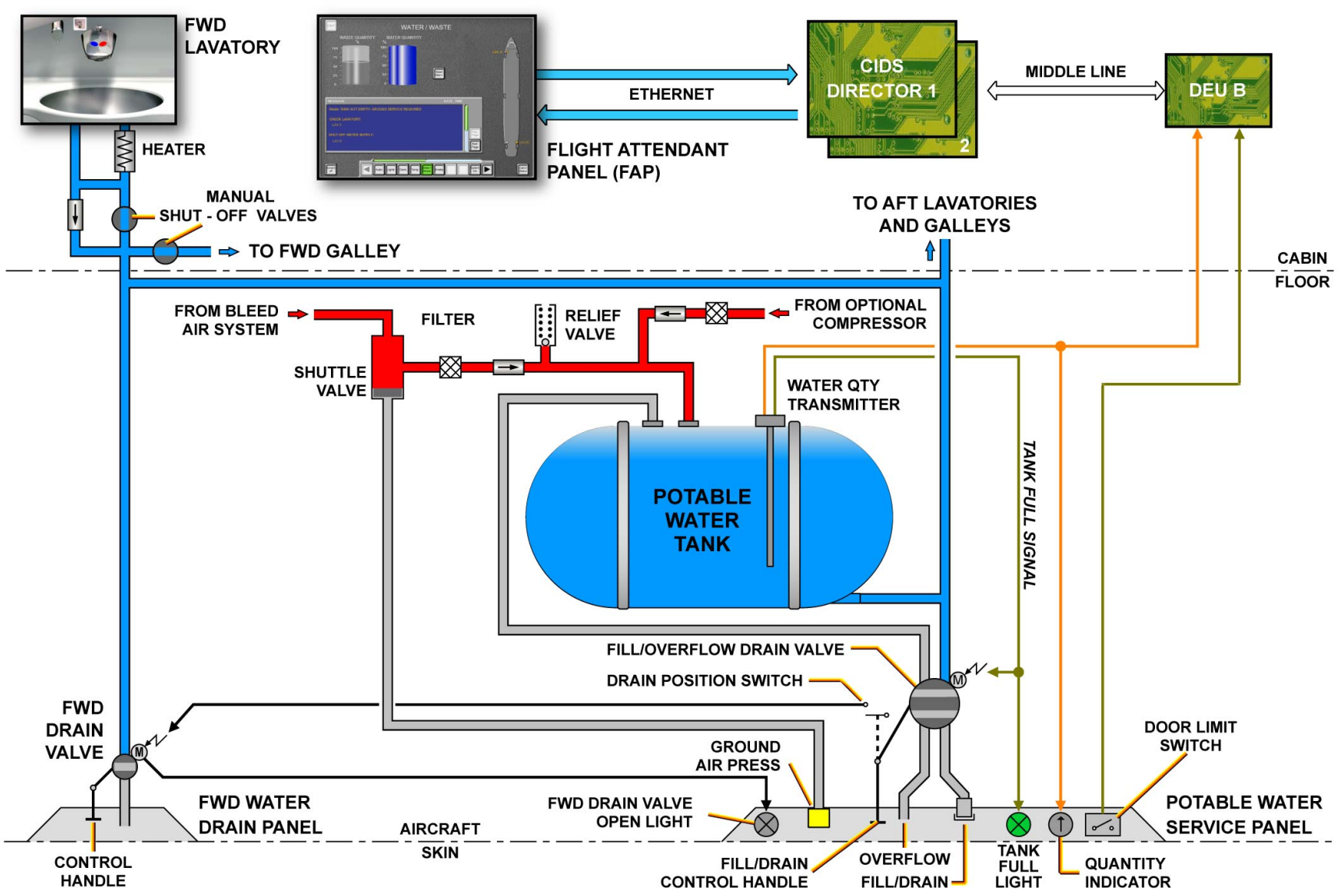
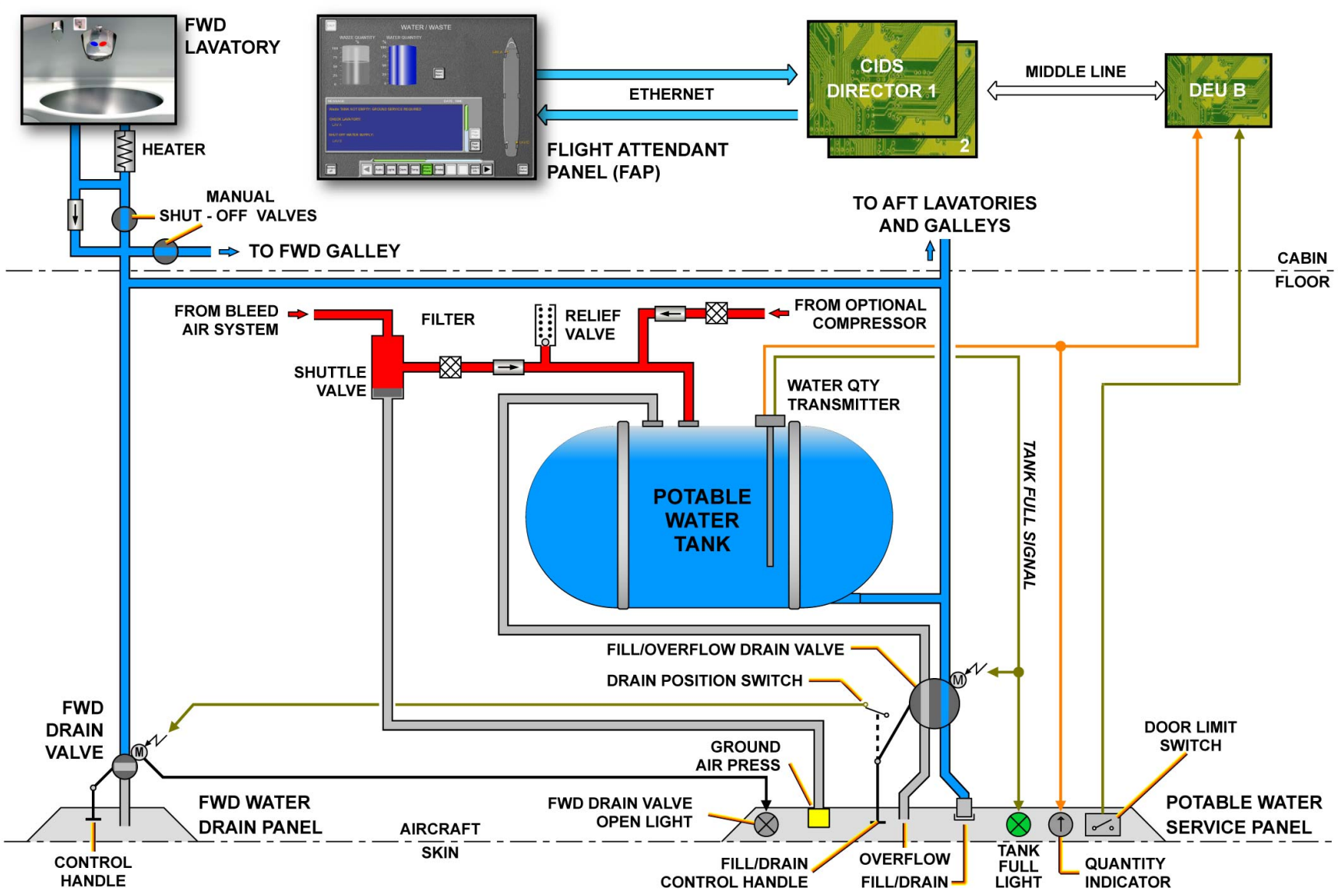


SERVICING - SYSTEM DRAINING



SERVICING - SYSTEM DRAINING

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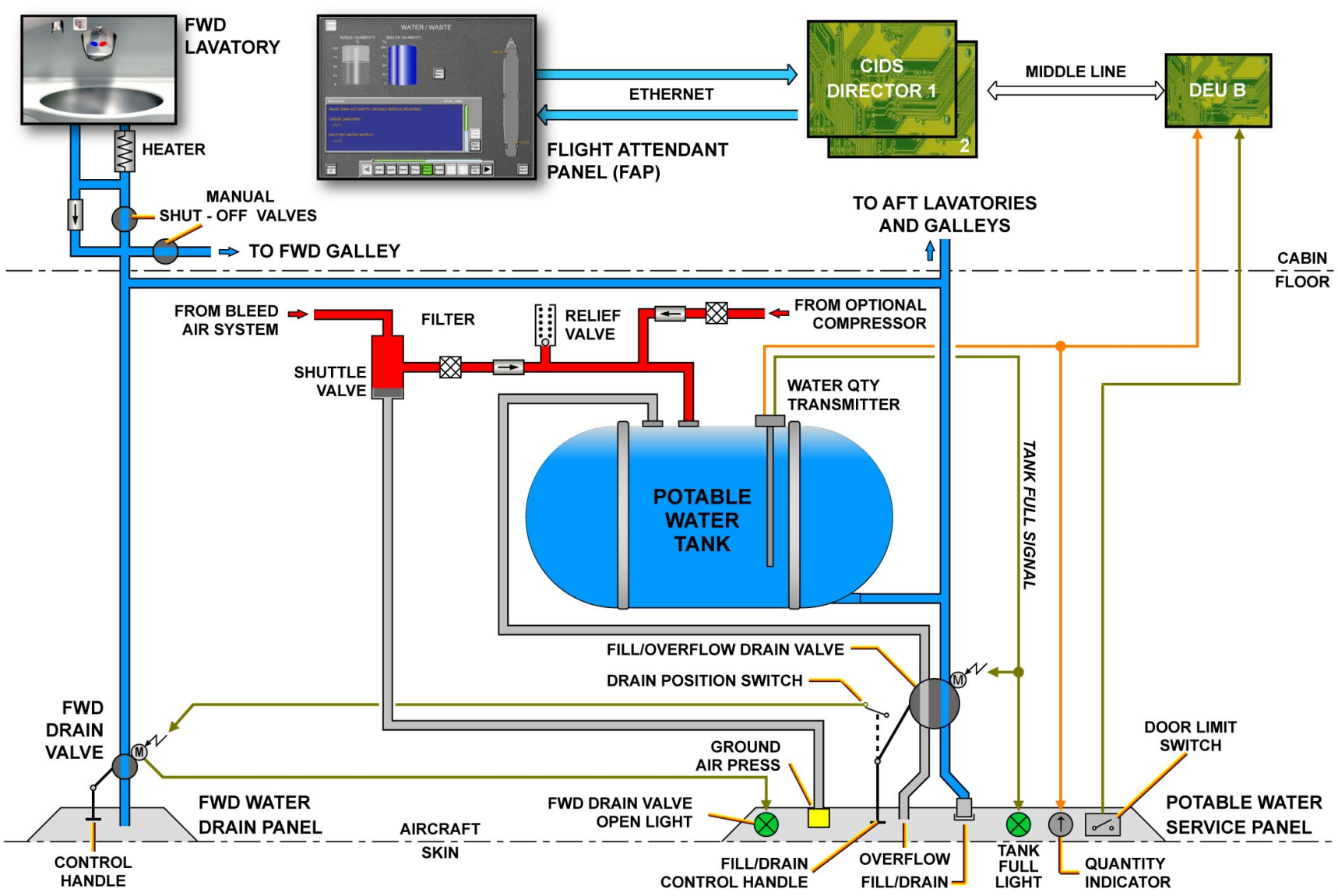
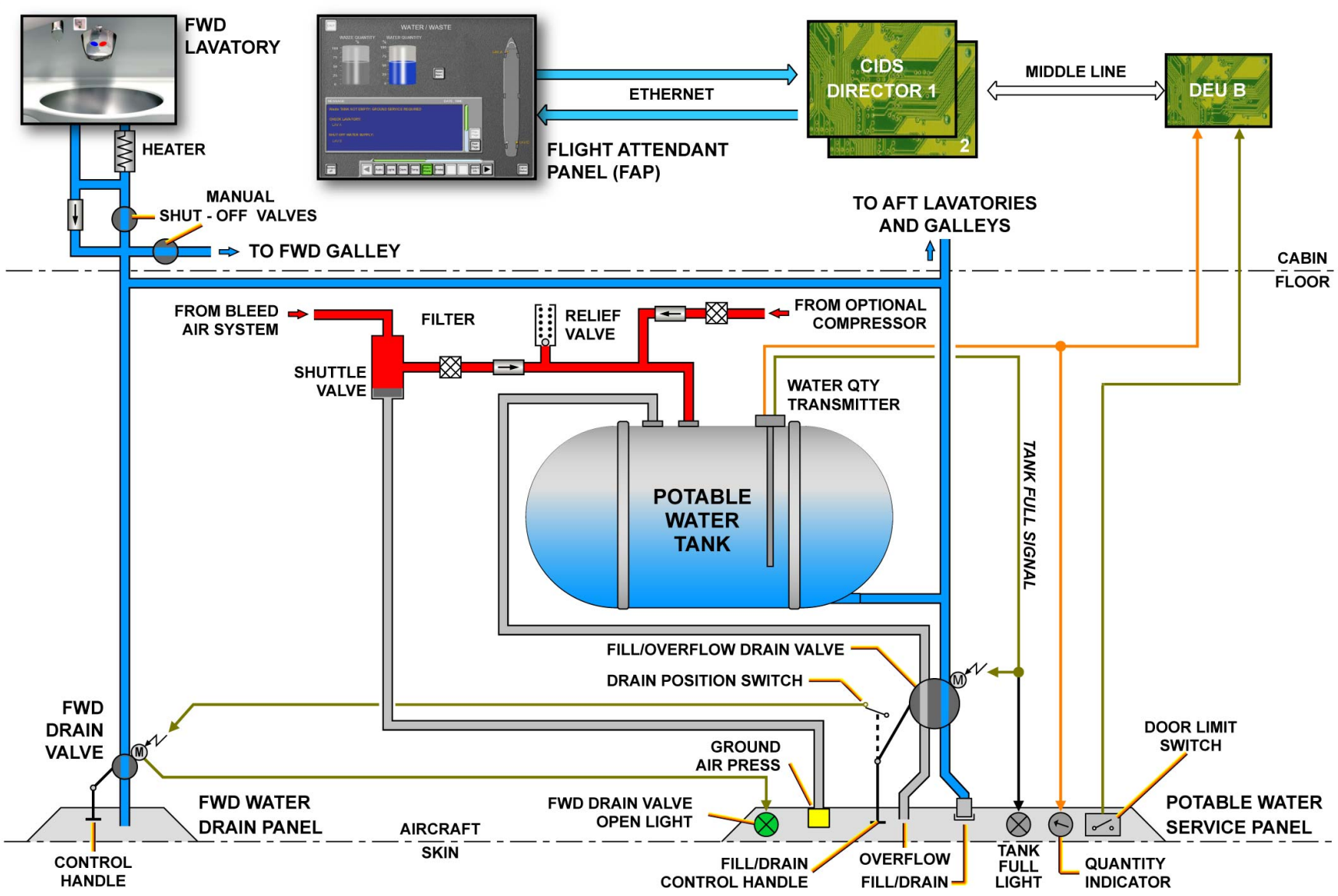
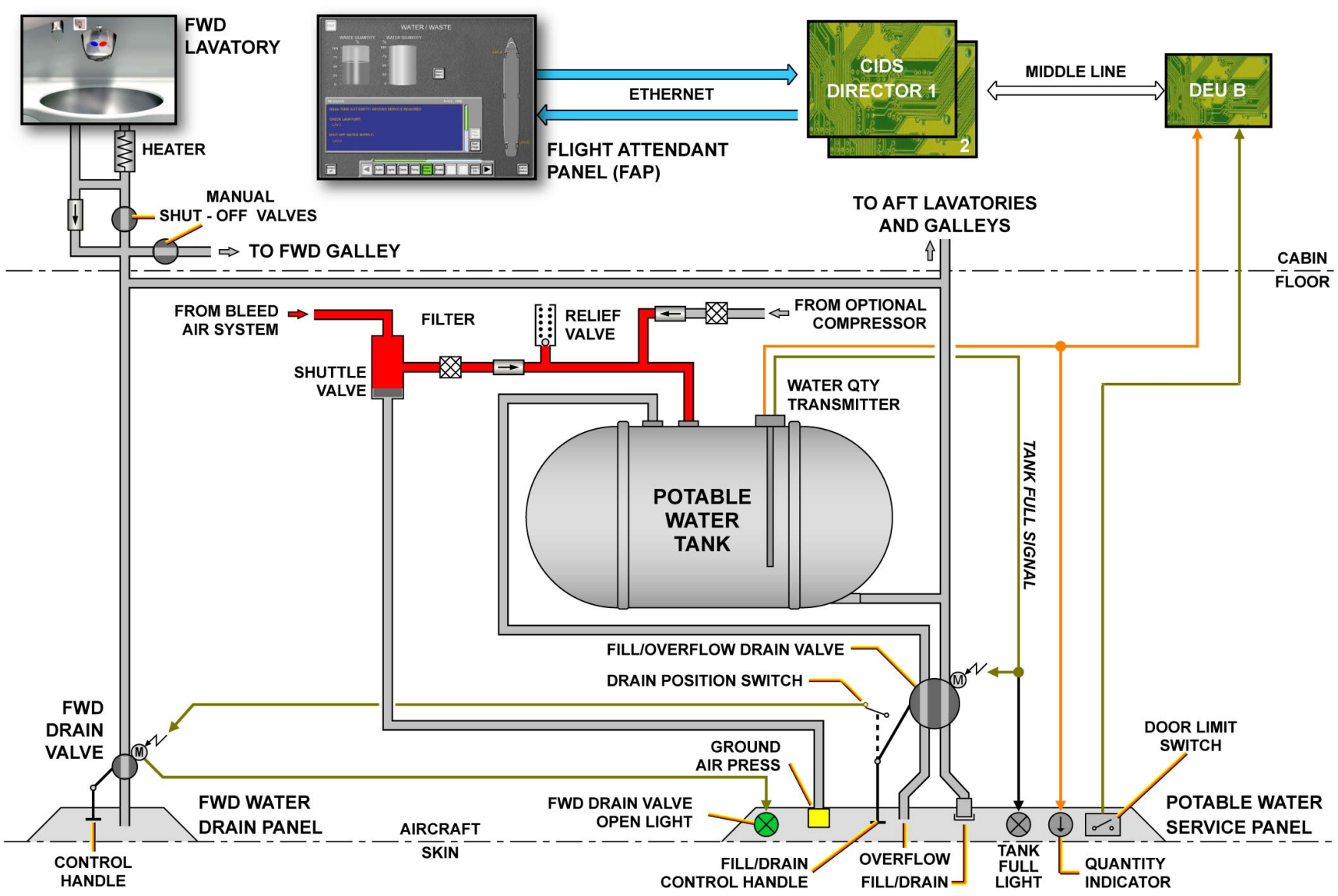


SERVICING - SYSTEM DRAINING



SERVICING - SYSTEM DRAINING



SERVICING - SYSTEM DRAINING

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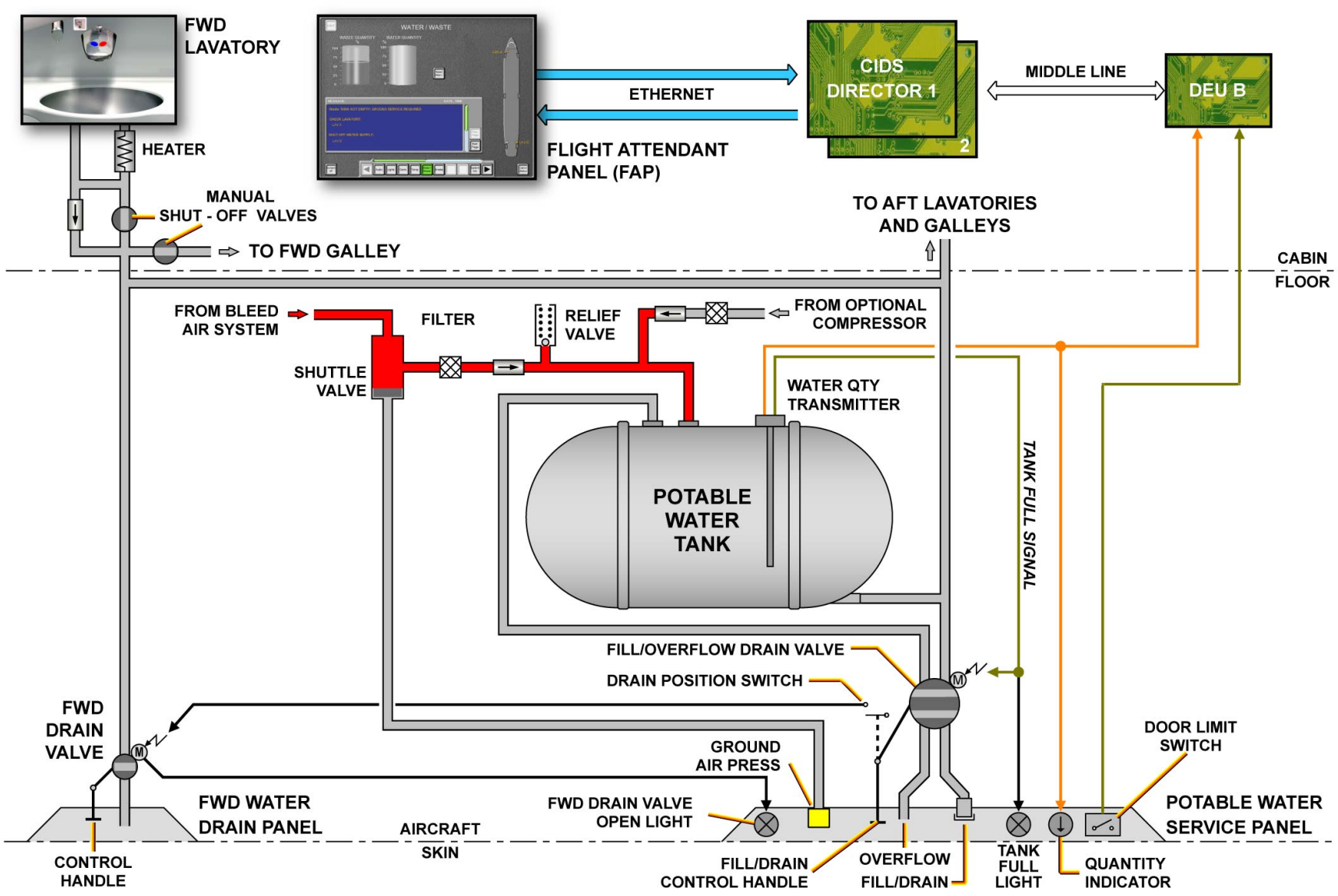

SERVICING - SYSTEM DRAINING

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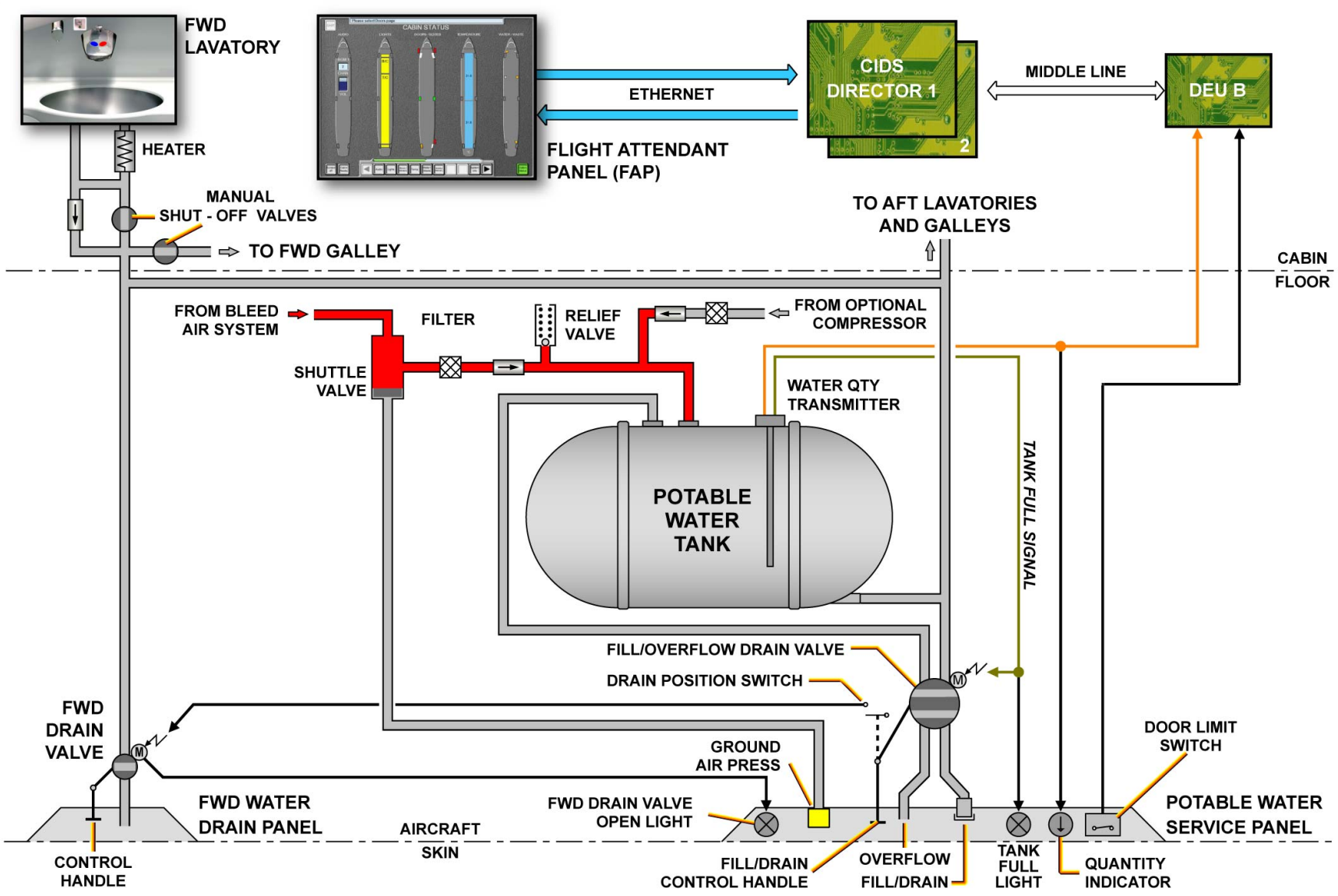

SERVICING - SYSTEM DRAINING

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UGB13131 - U7ST0M0 - UM38D1000000001

POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

GENERAL

The potable water controls and indicating includes the display on the Flight Attendant Panel (FAP) and two panels located at the bottom of the aircraft fuselage.

POTABLE WATER SERVICE PANEL

The potable water service panel is installed in the rear left hand side of the fuselage.

DOOR MICROSWITCH

The door microswitch isolates the indicating system when the potable water service panel is closed. When the door is open, the electric motor of the compressor is stopped (if installed). The water and waste page comes on automatically on the FAP when the service panel door is opened.

QUANTITY INDICATOR

The quantity indicator gives the level of the water in the potable water tank.

FILL/DRAIN CONTROL HANDLE

The fill/drain control handle is used to select a filling or draining operation.

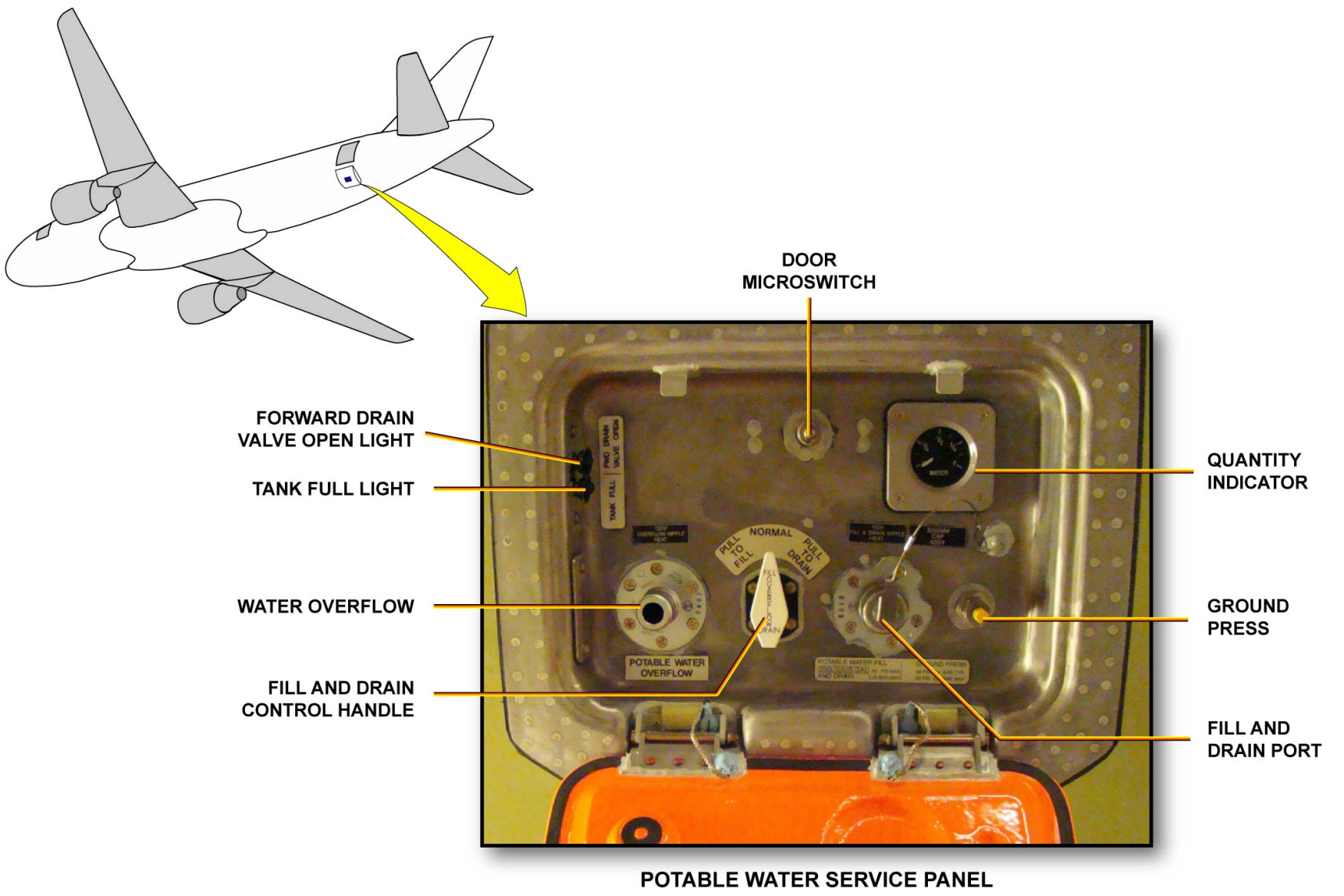
FORWARD DRAIN VALVE OPEN LIGHT

The forward drain valve open light comes on when the forward drain valve is open. The light has a lamp press to test facility.

TANK FULL LIGHT

The tank full light comes on when the water tank is full. The light has a press to test facility.

UGB13131 - U7ST0M0 - UM38I1000000001



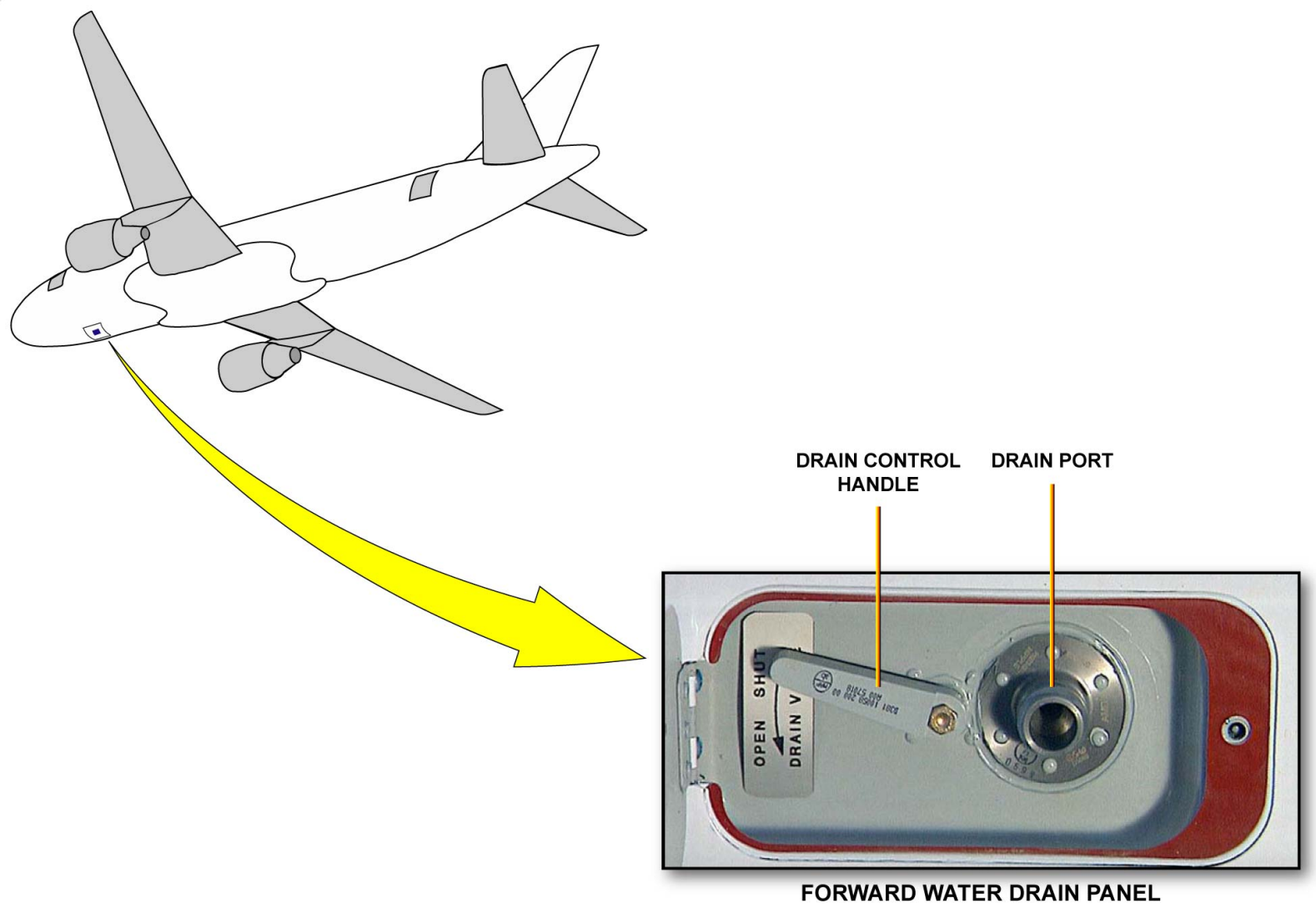
GENERAL & POTABLE WATER SERVICE PANEL

POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

FORWARD WATER DRAIN PANEL

The forward water drain panel is located on the A/C center line of the lower fuselage. The drain control handle is used to manually operate the forward drain valve.

UGB13131 - U7ST0M0 - UM38I1000000001



FORWARD WATER DRAIN PANEL

POTABLE WATER SYSTEM CONTROLS & INDICATING (2)

FAP

The FAP is located in the forward section of the cabin. The FAP displays the potable WATER QUANTITY stored in the potable water tank when the Water/Waste key on the FAP is selected. A tank symbol with a scale shows the liquid level as a percentage. The service door OPEN information, delivered by the door microswitch located on the potable water service panel, is sent to the FAP through a Decoder/Encoder Unit (DEU) B and the active Cabin Intercommunication Data System (CIDS) director to energize the water quantity indicating system.

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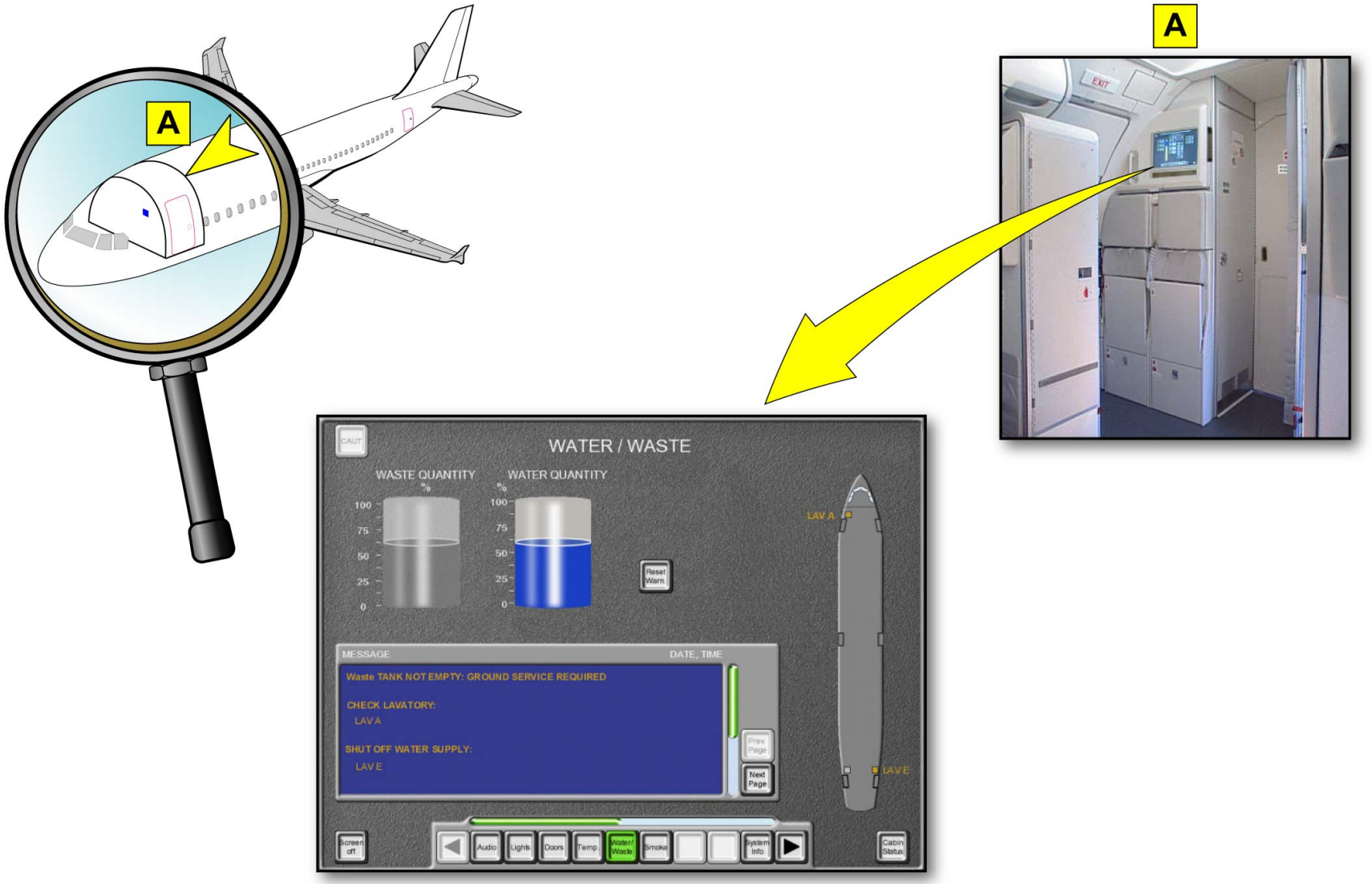


FLIGHT ATTENDANT PANEL (FAP)

FAP

WASTE WATER SYSTEM D/O (2)

GENERAL

The waste water drain system discards the waste water from the lavatory wash basins and from the galley sinks.

DRAIN ASSEMBLY

Each lavatory wash basin has a drain assembly with a valve actuated by a control knob and a cable.

NOTE: The control knob is operated by the lavatory user.

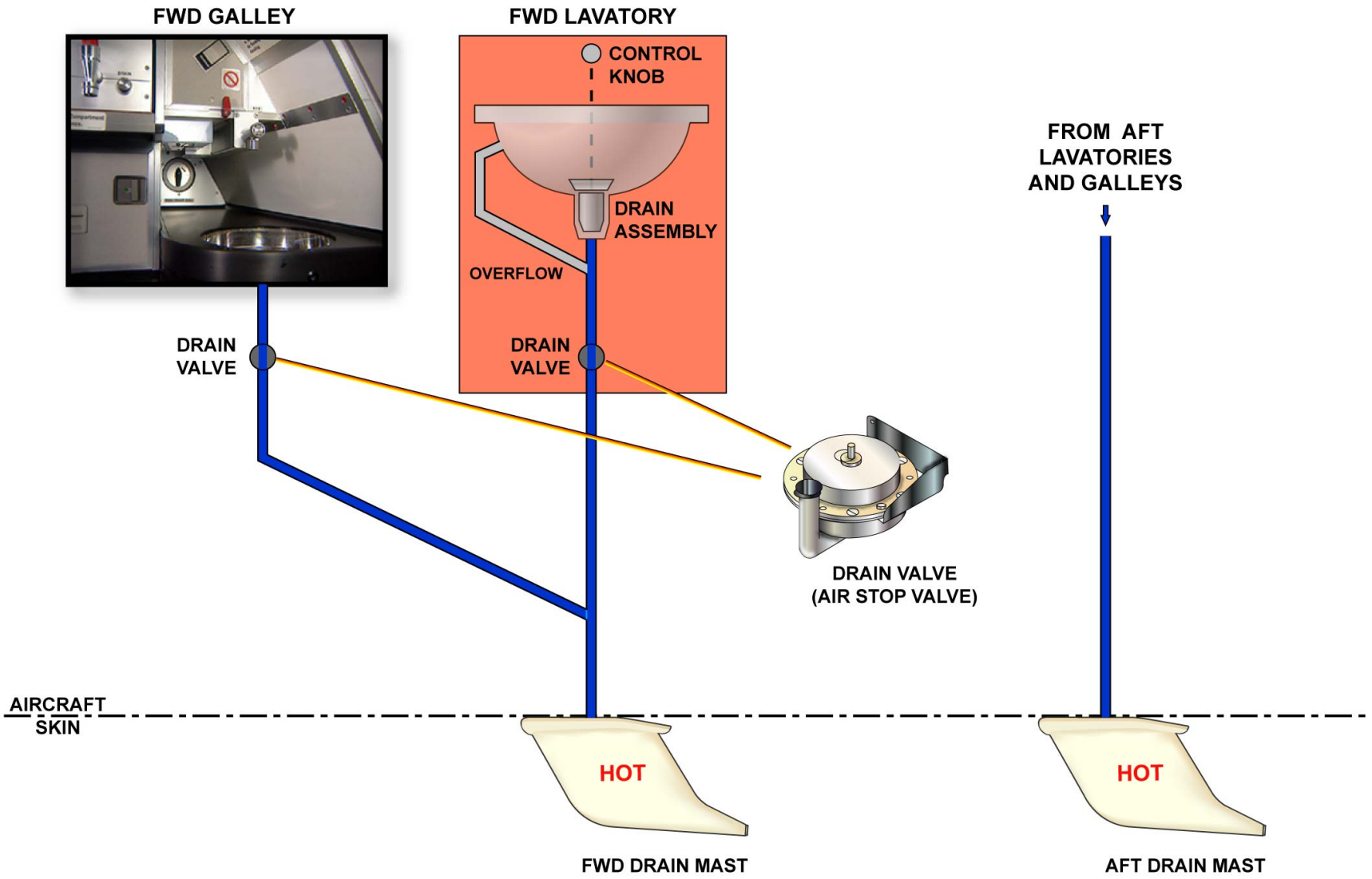
DRAIN VALVE

Each drain valve opens only when a certain amount of water is collected. This prevents a permanent loss of cabin air pressurization through the drain lines.

DRAIN MAST

In flight, differential pressure between the cabin and the drain mast outlet discards the waste water. On ground, gravity discards the waste water. The drain masts are electrically heated to prevent ice formation.

UGB13131 - U7ST0M0 - UM38D2000000001



GENERAL ... DRAIN MAST

TOILET SYSTEM PRINCIPLE (2)

GENERAL

Potable water from the aircraft pressurized potable water system is used to flush the toilet bowl. Differential pressure between the cabin and the atmosphere moves the waste from the toilet bowl to the waste holding tank. This difference of pressure can be caused by the vacuum generator or by aircraft pressurization.

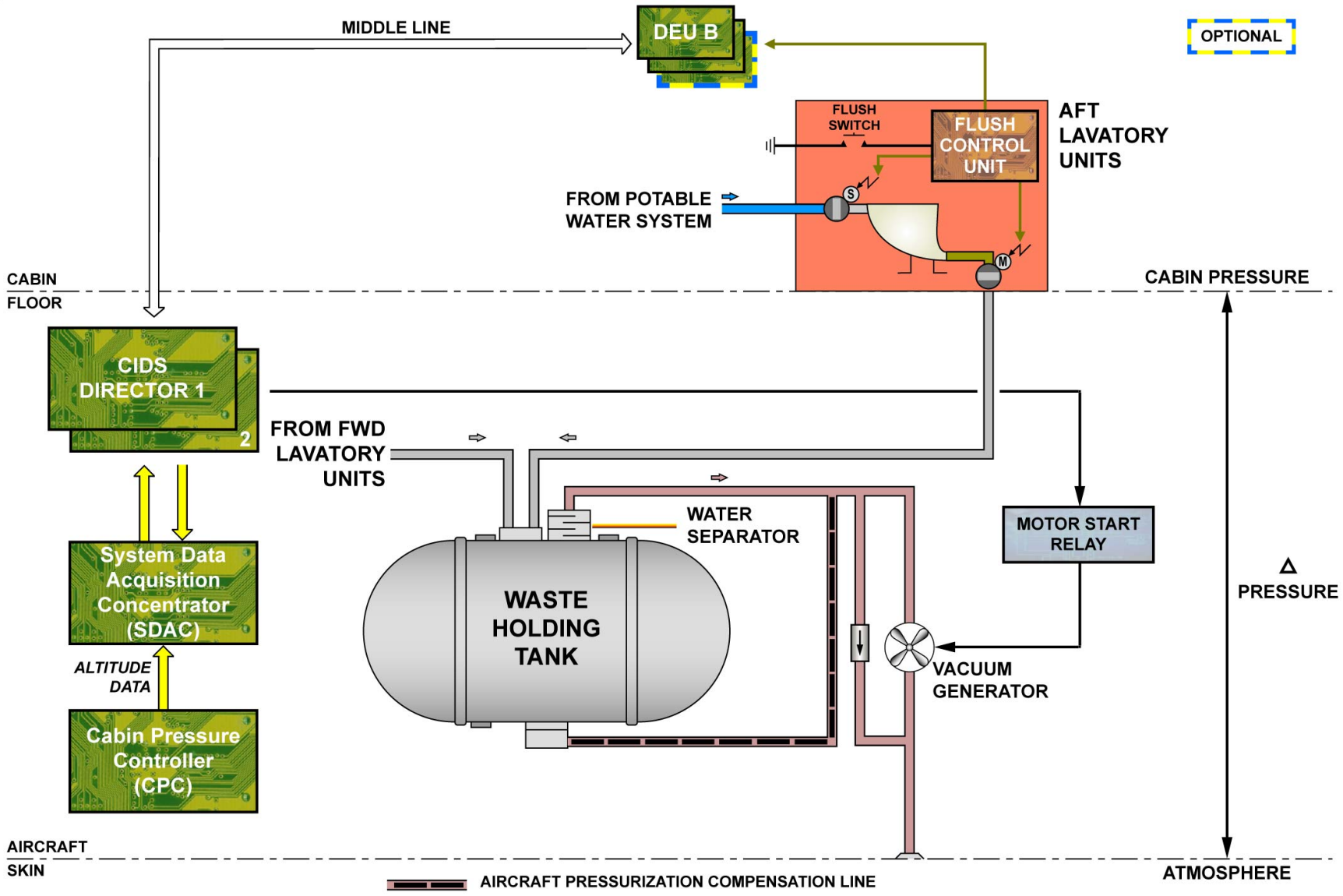
RINSE/FLUSH CONTROL

A flush control unit per toilet controls the time and sequence of the toilet operation during the flushing cycle.

VACUUM CONTROL

A vacuum generator is connected to the aircraft power circuit through the motor starting relay. As soon as a FLUSH switch is pressed, the flush control unit sends an electrical signal, through the connected Decoder/Encoder Unit (DEU) B to the Cabin Intercommunication Data System (CIDS) directors, which activates the motor starting relay according to the altitude. The Cabin Pressure Controller (CPC) supplies altitude data to CIDS via the System Data Acquisition Concentrator (SDAC). At high altitude, the CPC stops the electrical supply of the vacuum generator, the differential pressure between the cabin and the atmosphere being sufficient to move the waste from the toilet bowl to the waste holding tank. At low altitude or on ground, the vacuum generator generates the necessary differential pressure.

UGB13131 - U7ST0M0 - UM38P1000000002



GENERAL ... VACUUM CONTROL

UGB13131 - U7ST0M0 - UM38P1000000002

TOILET SYSTEM DESCRIPTION (3)

GENERAL

The toilet system removes waste from the toilet bowl through a vacuum drain to an underfloor waste holding tank. The vacuum toilet system is connected to the Cabin Intercommunication Data System (CIDS), which controls and monitors the system function and the related electric components. The system uses potable water from the potable water system to flush the toilet.

FLUSHING

When the FLUSH switch is pressed, the flush control unit initiates the flush sequence. The vacuum generator starts to operate and after 1.6 seconds the water valve opens for 1.7 seconds. Then, the flush valve, controlled by the flush control unit, opens for 4 seconds to evacuate the waste material through differential pressure.

VACUUM

As soon as the FLUSH switch is pressed, the flush control unit sends an electrical signal to the CIDS (via the connected Decoder/Encoder Unit (DEU) B), which operates the vacuum generator for approximately 15 seconds. The vacuum generator creates the necessary differential pressure between the cabin and the waste holding tank to move the waste from the toilet bowl. The vacuum generator is activated:
- on ground,
- during climb when the differential pressure is less than 246 mbar,
- during descent when the differential pressure is less than 203 mbar.

The different pressure information is supplied by the Cabin Pressure Controller (CPC) via the System Data Acquisition Concentrator (SDAC).

NOTE: The landing gear signal is used as a back- up in case the SDAC can not deliver altitude/ diff. press information. It overrides the door limit switch signal in flight to keep the system operational if the service panel door is open in flight.

STORAGE

The waste holding tank is installed on the right hand side of the aircraft under the floor between FRame 65 and FR 68. The tank has a capacity of 170 l (44.9 US gal). The tank has:
- a water separator,
- a liquid level transmitter (hydrostatic pressure),
- a liquid level sensor (ultrasonic type),
- waste inlets,
- a waste outlet,
- two rinse nozzles.

CONTROL/MONITORING

The waste system data is received by DEUs B and sent to the CIDS directors (DIRs). This system is controlled and monitored by the Vacuum System Controller (VSC) function, which is integrated inside the CIDS DIRs. The CIDS DIRs also report the vacuum toilet system failures to the Centralized Fault Display System (CFDS).

INDICATING

The waste holding tank is equipped with a liquid level transmitter and a liquid level sensor. When the tank is full, a signal is sent to the CIDS DIRs through the DEU B, which shuts down the toilet systems. The signal is also sent to the Flight Attendant Panel (FAP) through the DIRs and a "WASTE TANK NOT EMPTY-CHECK LEVEL GROUND SERVICE REQUIRED" message is displayed.

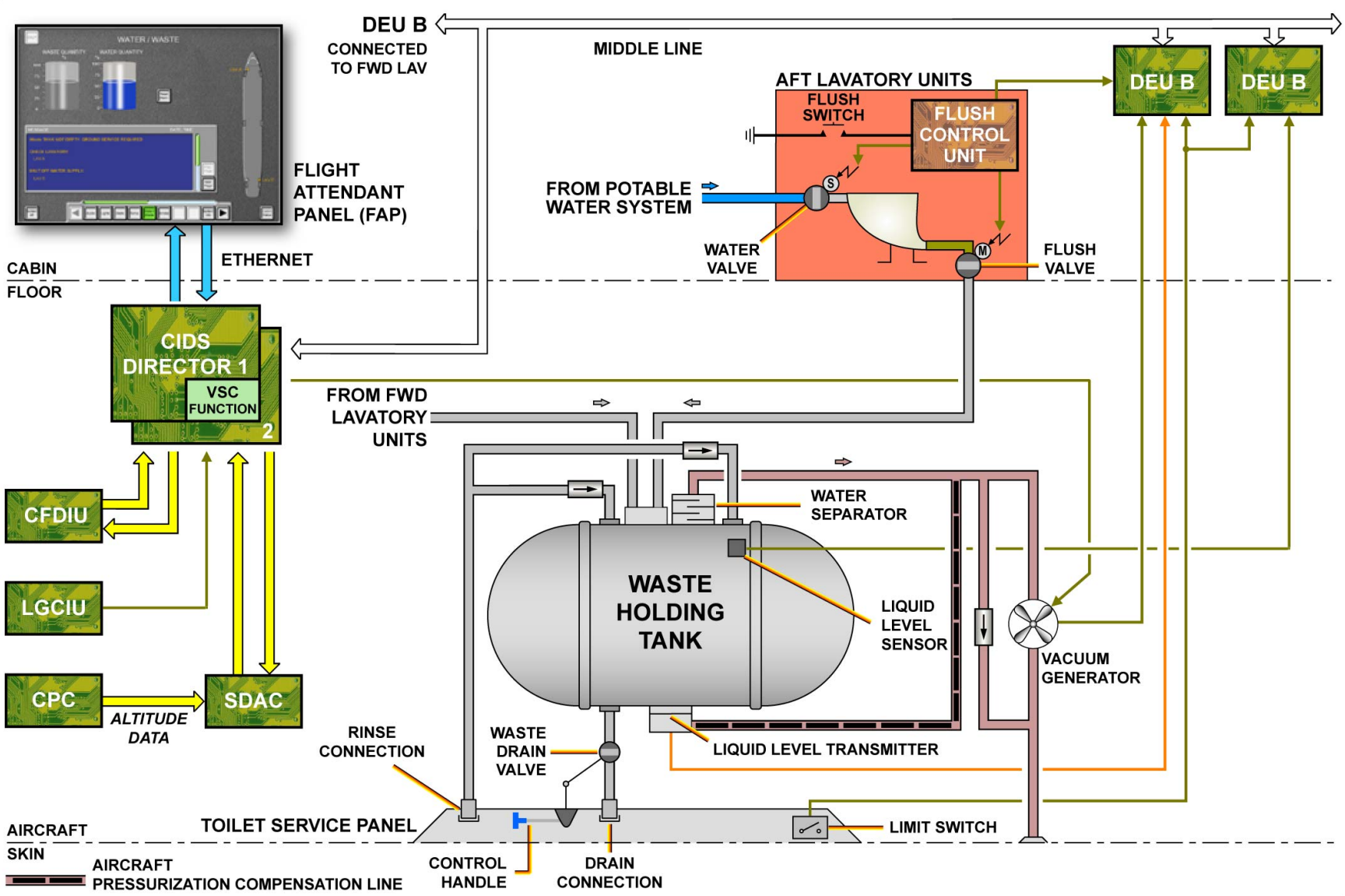
SERVICING

The waste holding tank is serviced from a service panel, which is located on the right of the lower fuselage between FR 65 and FR 66. It has:

- a drain connection,
- a rinse/flush connection,
- a waste drain valve control handle,
- a limit switch.

During servicing, the flush control units are automatically de-activated. Thus, toilet use is inhibited during servicing. The waste drain control handle mechanically operates the drain valve.

UGB13131 - U7ST0M0 - UM38D3000000002



GENERAL ... SERVICING

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UGB13131 - U7ST0M0 - UM38D3000000002

TOILET SYSTEM CONTROLS & INDICATING (2)

GENERAL

The toilet system controls and indicating include the waste quantity indication on the Flight Attendant Panel (FAP).

TOILET SERVICE PANEL

The toilet service panel is installed in the rear right hand side of the fuselage between FRame 65 and FR66.

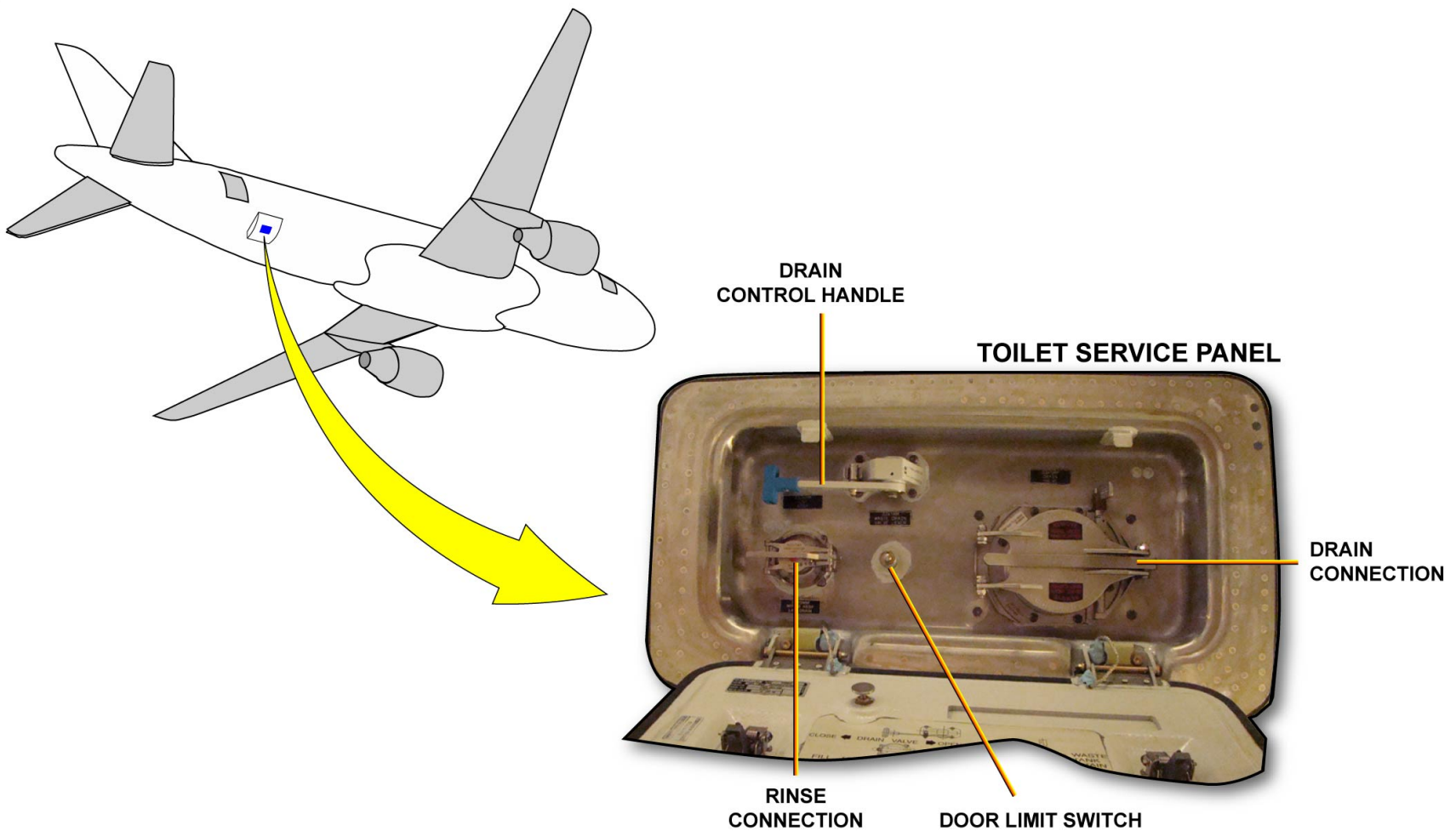
DOOR LIMIT SWITCH

On ground, when the toilet service panel door is open, the Cabin Intercommunication Data System (CIDS) stops all toilet operations through the Decoder/Encoder Unit (DEU) B and flush signals are inhibited.

DRAIN CONTROL HANDLE

During ground service, the drain control handle located at the service panel is used for the waste holding tank draining.

UGB13131 - U7ST0M0 - UM38I2000000002



GENERAL & TOILET SERVICE PANEL

TOILET SYSTEM CONTROLS & INDICATING (2)

FAP WATER/WASTE PAGE

The FAP is located in the forward section of the cabin. The FAP WATER/WASTE page appears by selecting the dedicated key on the tool bar. It can also appear automatically when the service door is open or when there is a fault in the system. This page gives information about the water and waste system. Fault, system and inoperative messages for the vacuum lavatories are also indicated on the FAP.

WASTE QUANTITY

The FAP displays the waste quantity stored in the waste holding tank. A waste tank symbol displays the filling level in percentage.

LAVATORY

On the aircraft symbol, the location of the lavatory is shown either activated with a grey square or de-activated with an amber square and its associated name. A lavatory is de-activated when the flush control unit is inoperative. An amber cross is displayed on the square in case of no communication with the flush control unit.

STATUS AND FAULT MESSAGES

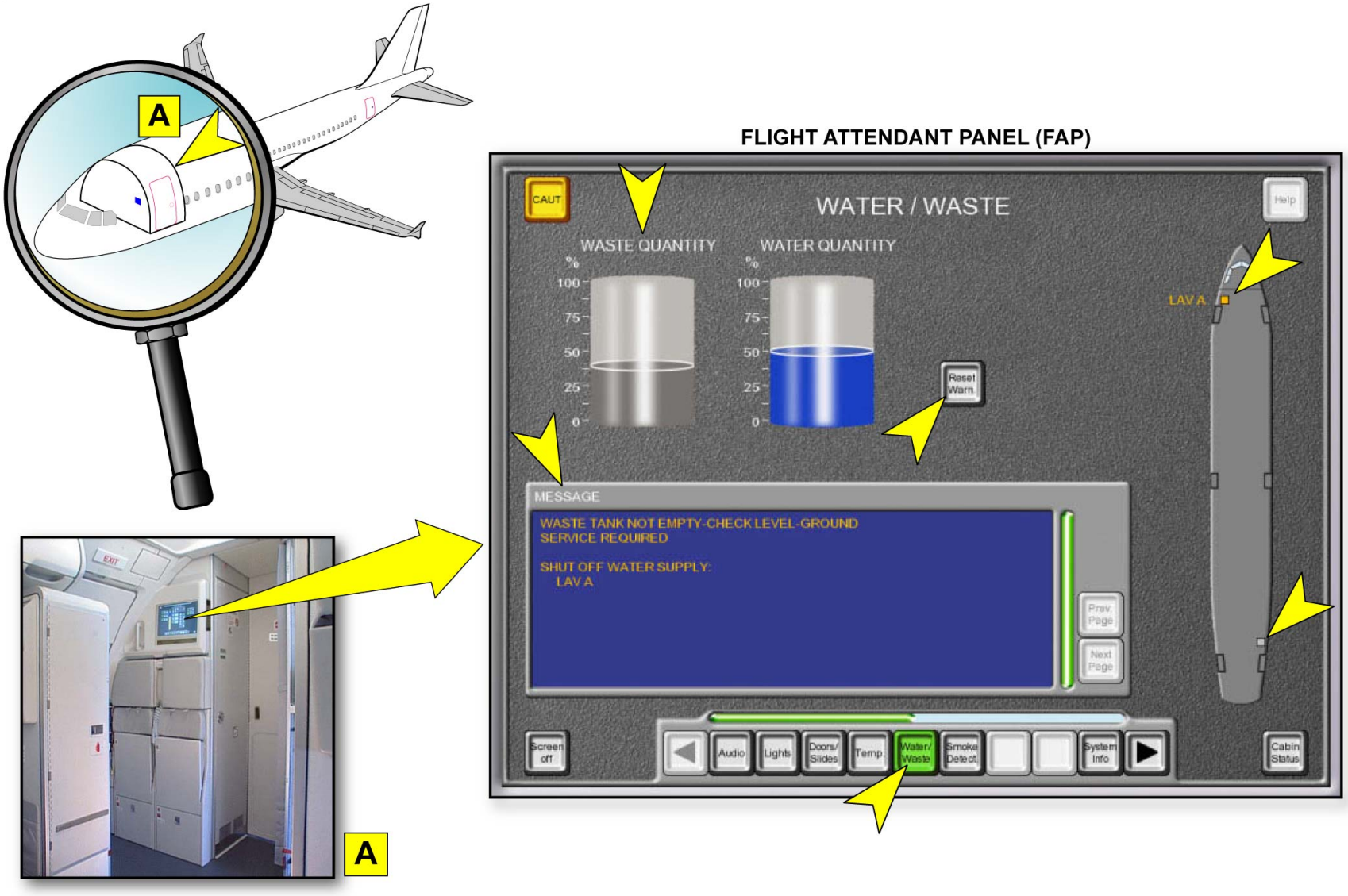
Status and fault messages of the water and waste system are displayed on a dedicated window.

NOTE: On ground, when the toilet service panel is open the "VACUUM SYSTEM DISABLED-GROUND SERVICING" message comes on.

RESET WARNING

A RESET WARNing button is used in case of flush valve failure. All visual warnings are reset by this same button (Area Call Panel, Attendant Indication Panel and lavatory call light).

UGB13131 - U7ST0M0 - UM38I2000000002



FAP WATER/WASTE PAGE - WASTE QUANTITY ... RESET WARNING

TOILET SYSTEM MONITORING (3)

GENERAL

The toilet system is monitored by the Vacuum System Controller (VSC) function, which is integrated inside the Cabin Intercommunication Data System (CIDS) director (DIR). During aircraft power-up on ground and during flight, the system external circuits of the vacuum toilet system are monitored continuously.

FLUSH CONTROL UNIT

The BITE in each flush control unit monitors the water valve, the flush valve and the internal control circuitry. If a fault is detected, it is transmitted through the Decoder/Encoder Unit (DEU) B to DIR 1 and 2 of the CIDS.

VSC FUNCTION

The VSC functions integrated inside the CIDS DIRs are:
- system control and monitoring,
- fault reporting.

The DIR calculates and transmits signals to the Flight Attendant Panel (FAP) to indicate the waste tank level and to report system defects. The DEU B transmits system defects to the DIR through the middle line data bus. The DIR memorizes the defect signals and send them to the Centralized Fault Display System (CFDS) for ground maintenance and inspection.

NOTE: Each toilet assembly is connected to a DEU B.

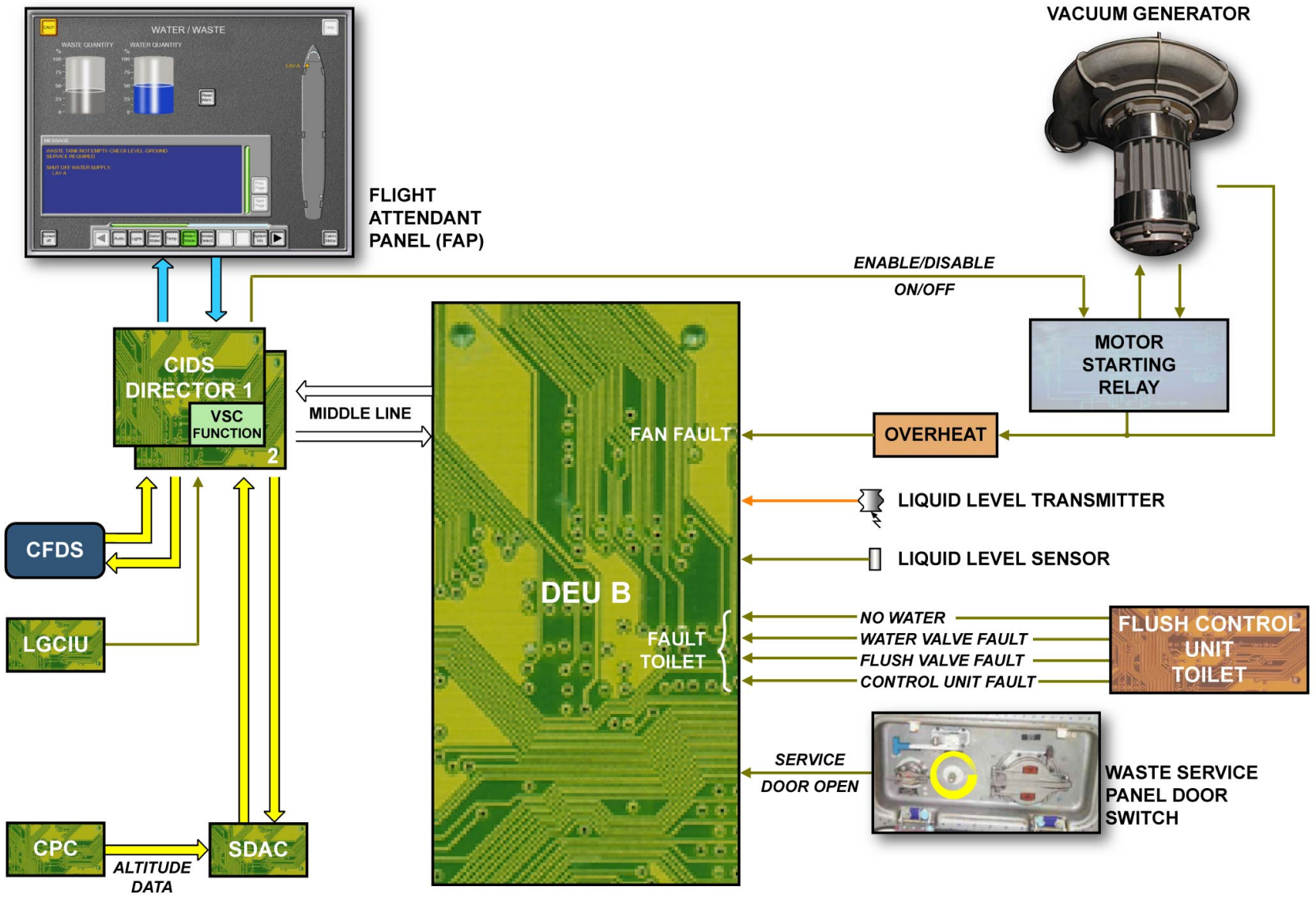
FAP WATER/WASTE PAGE INDICATING

The FAP WATER/WASTE page gives information about water and waste. The waste tank level is displayed on this page. Fault, system and inoperative messages can also be displayed in the list box and on the A/C symbol to indicate if a lavatory is inoperative or if the whole toilet system is inoperative.

Examples of messages list box:
- VACUUM SYSTEM DISABLED-WASTE TANK FULL: If the LLS and the LLT do not operate, the system will not operate,
- VACUUM SYSTEM DISABLED-GROUND SERVICING: When the limit switch on the waste service panel indicates OPEN panel and the aircraft is on ground:

A CAUTion amber button, located in the upper left corner of the touchscreen, comes on and flashes when CIDS receives a message which cannot be shown immediately.

UGB13131 - U7ST0M0 - UM38D400000002

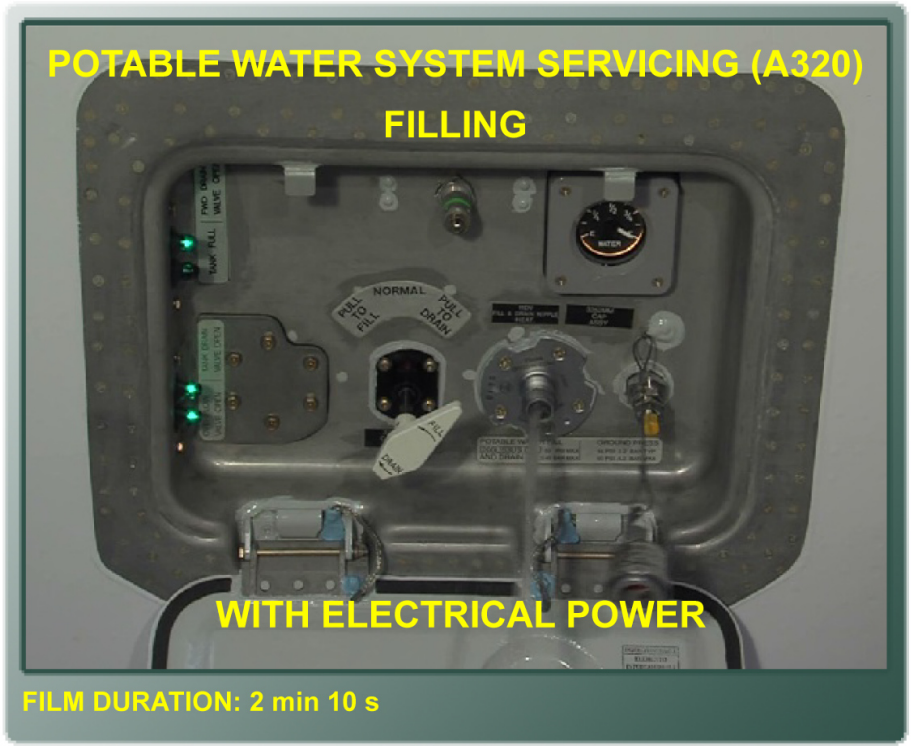


GENERAL ... FAP WATER/WASTE PAGE INDICATING

POTABLE WATER SYS SERVICING (A320) (2)

FILLING WITH ELECTRICAL POWER

First open the Potable Water Service Panel and the light from the quantity indicator comes on.
On the Flight Attendant Panel you will see the text "GROUND SERVICE DOOR OPEN" is shown.
Remove the potable water fill and drain port cap.
Connect the fill hose to the potable water fill and drain port.
Turn the fill and drain control handle to the " FILL" position and pull it out.
Check that the "OVERFLOW VALVE OPEN" light comes on. If it doesn't illuminate, check the light and the overflow valve function.
Start the pump on the service vehicle.
The quantity indicator shows that the system is taking on water.
When the tank is full, the "FULL LIGHT" comes on and the handle returns automatically to its NORMAL position.
Check that the "OVERFLOW VALVE OPEN" light goes off.
Disconnect the fill hose from the potable water fill and drain port.
Clean and dry the fill and drain port. Put the cap on the potable fill and drain port.
Clean and dry the service panel and the adjacent area.
Close the service panel and clean it.
On the Flight Attendant Panel (WATER AND WASTE PAGE) you can check the water quantity, make sure that text message: "WATER SERVICE DOOR OPEN" is not shown any more.



FILLING WITH ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A320) (2)

FILLING WITHOUT ELECTRICAL POWER

Open the Potable Water Service Panel, there is no light and no indication on the gage.
Open the potable water fill and drain port.
Open the tank drain access panel and open the overflow valve handle to the open position.
Connect the fill hose to the potable water fill and drain port.
Turn the fill and drain control handle to the fill position and pull it out.
Start the pump on the service vehicle.
The quantity indicator will show no change in water quantity.
When the tank is full, water will flow out from the tank overflow port.
Stop the pump on the service vehicle and push the fill and drain control handle in and turn it to the normal position.

NOTE: The Handle does not return to the normal position automatically.
Disconnect the fill hose from the potable water fill and drain port.
Close the tank overflow valve with the handle.
Clean and dry the fill and drain port. Put the cap on the potable water fill and drain port.
Clean and dry the service panel area and the tank drain panel area.
Close the tank drain and the service panel and check for leaks, because leaks are not permitted.

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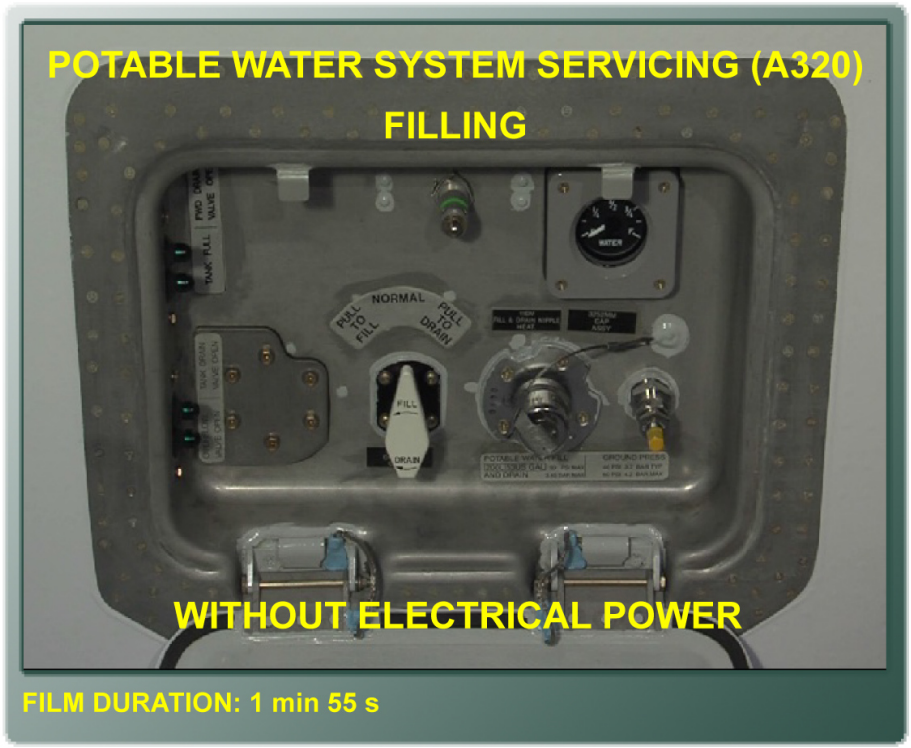

FILLING WITHOUT ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A320) (2)

DRAINING WITH ELECTRICAL POWER

Open the Potable Water Service Panel, the indication on the gage is illuminated.
On the Flight Attendant Panel you will see the text "GROUND SERVICE DOOR OPEN" is shown.
Remove the cap of the potable water fill and drain port.
Turn the fill and drain control handle to the drain position and pull it out.
Check that the following control lights come on:
The forward drain valve, tank drain valve, and the overflow valve.
Water will flow from all three ports, but the main quantity will come from the tank drain port.
The water should be collected in a container.
The quantity indicator will show the decreasing water level. When the tank is completely empty, push the control handle in and turn it to the normal position.

NOTE: The handle does not return to the normal position automatically.
All three indicators lights go off again.
Clean and dry the fill and drain port. Put the cap on the potable water fill and drain port.
Clean and dry the panel areas.
Close the Potable Water Service Panel and clean it.
On the Flight Attendant Panel (WATER AND WASTE PAGE) you can check the water quantity, make sure that text message: "WATER SERVICE DOOR OPEN" is not shown any more.

UGB13131 - U7ST0M0 - UM38Y1000000001

DRAINING WITH ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A320) (2)

DRAINING WITHOUT ELECTRICAL POWER

Open the Potable Water Service Panel, no indication will be shown on the gage.
Remove the cap of the potable water fill and drain port.
Turn the fill and drain control handle to the drain position and pull it out.
Open the tank drain panel, to operate the tank overflow valve handle, and the tank drain valve control handle to the open position.
Open the forward drain panel and operate the drain valve control handle to the open position.
Water will flow from all three ports, but the main quantity will come from the tank drain port.
The water should be collected in a container.
The quantity indicator will not show the decreasing water level. When the tank is completely empty, push the fill drain control handle in and turn it to the normal position.
NOTE: The handle does not return to the normal position automatically.
Clean and dry the fill and drain port. Put the cap on the potable water fill drain port.
Clean and dry the panel areas.
Close all three panels and clean them.

UGB13131 - U7ST0M0 - UM38Y1000000001

DRAINING WITHOUT ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A318/319/321) (2)

FILLING WITH ELECTRICAL POWER

First open the potable water panel and the light from the quantity indicator comes on.

NOTE: On the Flight Attendant Panel you will see the text "GROUND SERVICE DOOR OPEN" is shown.

Remove the potable water fill and drain port cap. Connect the fill hose to the potable water fill and drain port. Turn the fill and drain control handle to the " FILL" position and pull it out. The quantity indicator shows that the system is taking on water. When the "TANK FULL LIGHT" comes on the fill and drain control handle will automatically return to the NORMAL Position. Disconnect the fill hose from the potable water fill and drain port. Clean and dry the fill and drain port. Put the cap on the potable fill and drain port. Clean and dry the service panel and the adjacent area. Close the service panel and clean it. On the Flight Attendant Panel (WATER AND WASTE PAGE) you can check the water quantity, make sure that text message: "WATER SERVICE DOOR OPEN" is not shown any more.

UGB13131 - U7ST0M0 - UM38Y1000000002

FILLING WITH ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A318/319/321) (2)

FILLING WITHOUT ELECTRICAL POWER

Open the potable water panel, there is no light and no indication on the gage. Open the potable water fill and drain port. Connect the fill hose to the potable water fill and drain port. Turn the fill and drain control handle to the fill position and pull it out. The quantity indicator will show no change in water quantity. When the tank is full, water will flow out from the potable water overflow port. Push the control handle in and turn it to the normal position.

NOTE: The handle does not return to the normal position automatically. Disconnect the fill hose from the potable water fill and drain port. Clean and dry the fill and drain port. Put the cap on the potable water fill and drain port. Clean and dry the service panel area. Close the service panel and clean it.

UGB13131 - U7ST0M0 - UM38Y1000000002

FILLING WITHOUT ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A318/319/321) (2)

DRAINING WITH ELECTRICAL POWER

First open the potable water panel and the light from the quantity indicator comes on.

NOTE: On the FAP the water and waste page will be shown with the text message: WATER SERVICE DOOR OPEN.

Remove the cap from the potable water fill and drain port. Turn the Fill and Drain Handle to the drain position and pull it out. The forward drain valve light comes on and the water flows out of the potable water fill and drain port as well as from the forward drain panel. When the water is completely drained, you have to manually close the drain valve. By pushing in the handle and turn it back to the normal position. The forward drain valve light goes off again. Clean and dry the fill and drain port. Put the cap on the potable water fill and drain port. In cold weather conditions, the drain valves should remain open to prevent damage to the potable water system. Clean and dry the service panel and the adjacent area. Close the service panel and clean it.

UGB13131 - U7ST0M0 - UM38Y1000000002

DRAINING WITH ELECTRICAL POWER

POTABLE WATER SYS SERVICING (A318/319/321) (2)

DRAINING WITHOUT ELECTRICAL POWER

Open the Potable Water Service Panel, no indication will be shown on the gage.
Remove the cap of the potable water fill and drain port.
Turn the fill and drain control handle to the drain position and pull it out.
Open the forward drain panel and operate the drain valve control handle to the open position.
Water will flow from the two ports, but the main quantity will come from the potable water service panel.
The water should be collected in a container.
The quantity indicator will not show the decreasing water level. When the tank is completely empty, push the fill drain control handle in and turn it to the normal position.

NOTE: The handle does not return to the normal position automatically.
Clean and dry the fill and drain port. Put the cap on the potable water fill and drain port.
Clean and dry the panel areas.
Close both panels and clean them.

UGB13131 - U7ST0M0 - UM38Y1000000002

DRAINING WITHOUT ELECTRICAL POWER

TOILET SYSTEM SERVICING (2)

SERVICING

Open the Waste Service Panel Door, and on the FAP the Water/ Waste page will be shown, with the text message: "Vacuum System Disabled-Ground Servicing". Open the cap of the waste drain connection. Connect the toilet service vehicle drain hose to the waste drain connection. Push the inner flap lever to "open". Move the drain valve control-handle to the open position and empty the waste tank completely. Close the waste drain valve and connect the flush/ fill hose of the toilet service vehicle to the rinse and fill connection. Flush the waste tank with approximately 57 L (15.06 Us gal). Then open the drain valve and make sure that the fluid has drained completely and close the waste drain valve again. Use the toilet service vehicle and fill the waste tank with 10L (2.46Usgal) of disinfectant solution or water. Switch off the toilet vehicle pump. Remove the flush and the drain hose and close the drain cap.

NOTE: The inner flap will close and lock automatically when you close the outer drain cap. Make sure there are no leaks from the waste drain connection, leaks are not permitted.

Disconnect the flush/ fill hose and let the connection drain completely. Close the cap of the fill and rinse connection. Clean and dry the service panel area. Close the Waste Service Door. On the Flight Attendant Panel make sure that the message box " Vacuum System Disabled - Ground Servicing" disappears.

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SERVICING

WATER/WASTE SYSTEM LINE MAINTENANCE (2)

SERVICING

POTABLE WATER SERVICING

The potable water system supplies the galleys and toilets with water from the tank via a distribution system. The tank is pressurized by air either:
- from the pneumatic system,
- or from a ground cart connected to the ground connector,
- or optionally from a compressor.

On the A320 only, two valves are used for filling:
- the fill/drain valve, this is opened manually and closed electrically,
- the overflow valve, this is opened and closed electrically.

Four valves are used for draining:
- the fill/drain valve, this is opened and closed manually,
- the FWD drain valve, tank drain valve and overflow valve, these are opened and closed electrically.

NOTE: On A320, if there is no electrical power all four valves can be manually operated.

On A318, A319 and A321, one valve is used for filling:
- the overflow/fill/drain valve, this is opened manually and closed electrically.

Two valves are used for draining:
- the overflow/fill/drain valve, this is manually operated,
- the FWD drain valve, this is electrically operated.

NOTE: On A318, A319 and A321, if there is no electrical power both valves must be manually operated.

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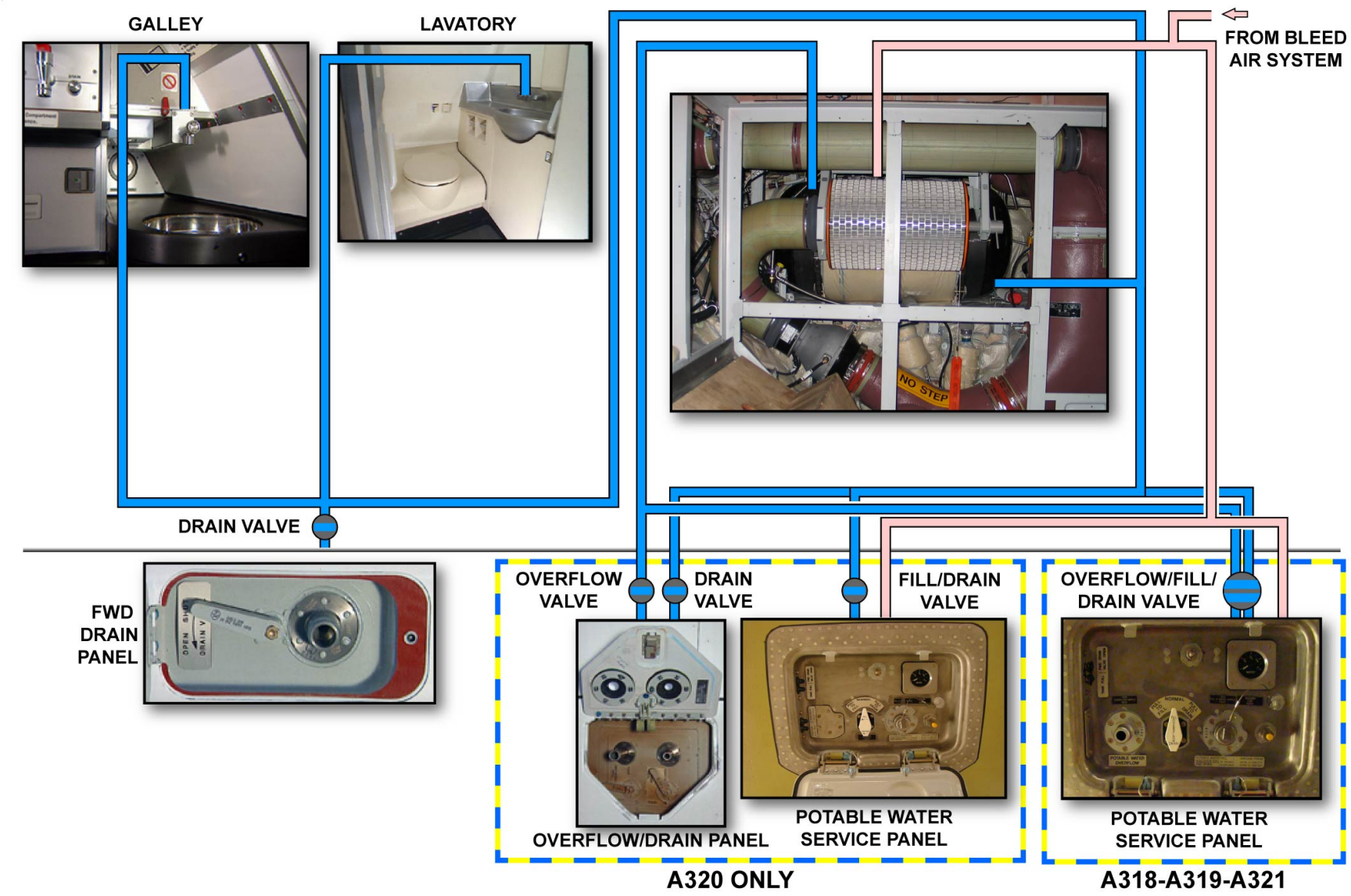

SERVICING - POTABLE WATER SERVICING

WATER/WASTE SYSTEM LINE MAINTENANCE (2)

SERVICING (continued)

TOILET SYSTEM SERVICING

Connect the toilet service vehicle to the toilet service panel.
Move the drain valve control-handle from the closed to the open position.
Drain the waste from the toilet tank.
Flush the waste tank with a maximum of 57 l (15.0576 USgal) of water with a maximum pressure of 3.45 bar (50.0380 psi) .

NOTE: The time necessary for this flushing will be approximately 90 seconds.

Drain the water from the tank.
Fill the toilet tank with 10 l of disinfectant solution.
Do not discharge products such as oil, fuel, solvent or lubricant in trash bins, soil or into the water network (drains, gutters, rain water, waste water, etc...)
Sort waste fluids and use special waste disposal containers.

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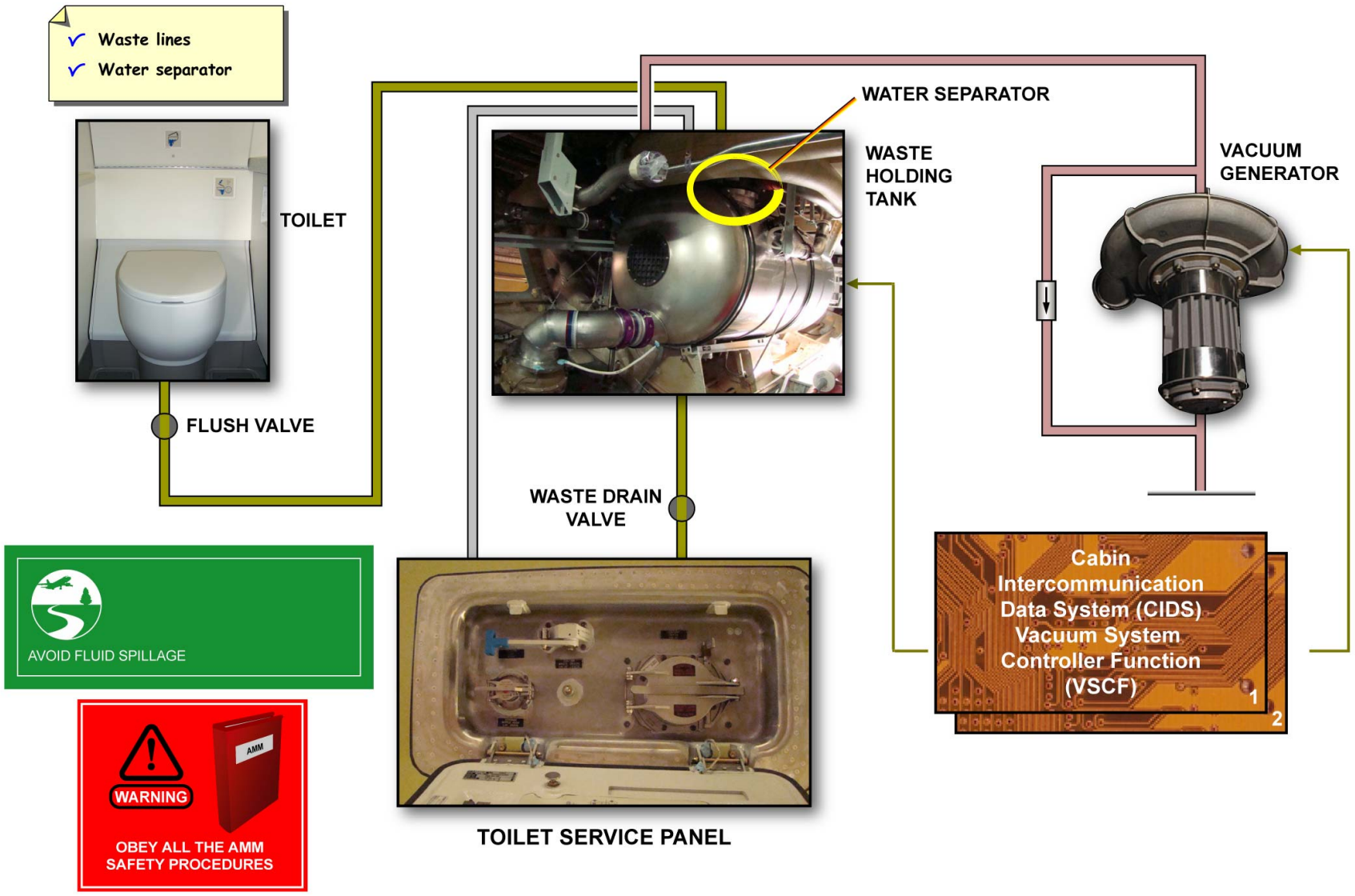
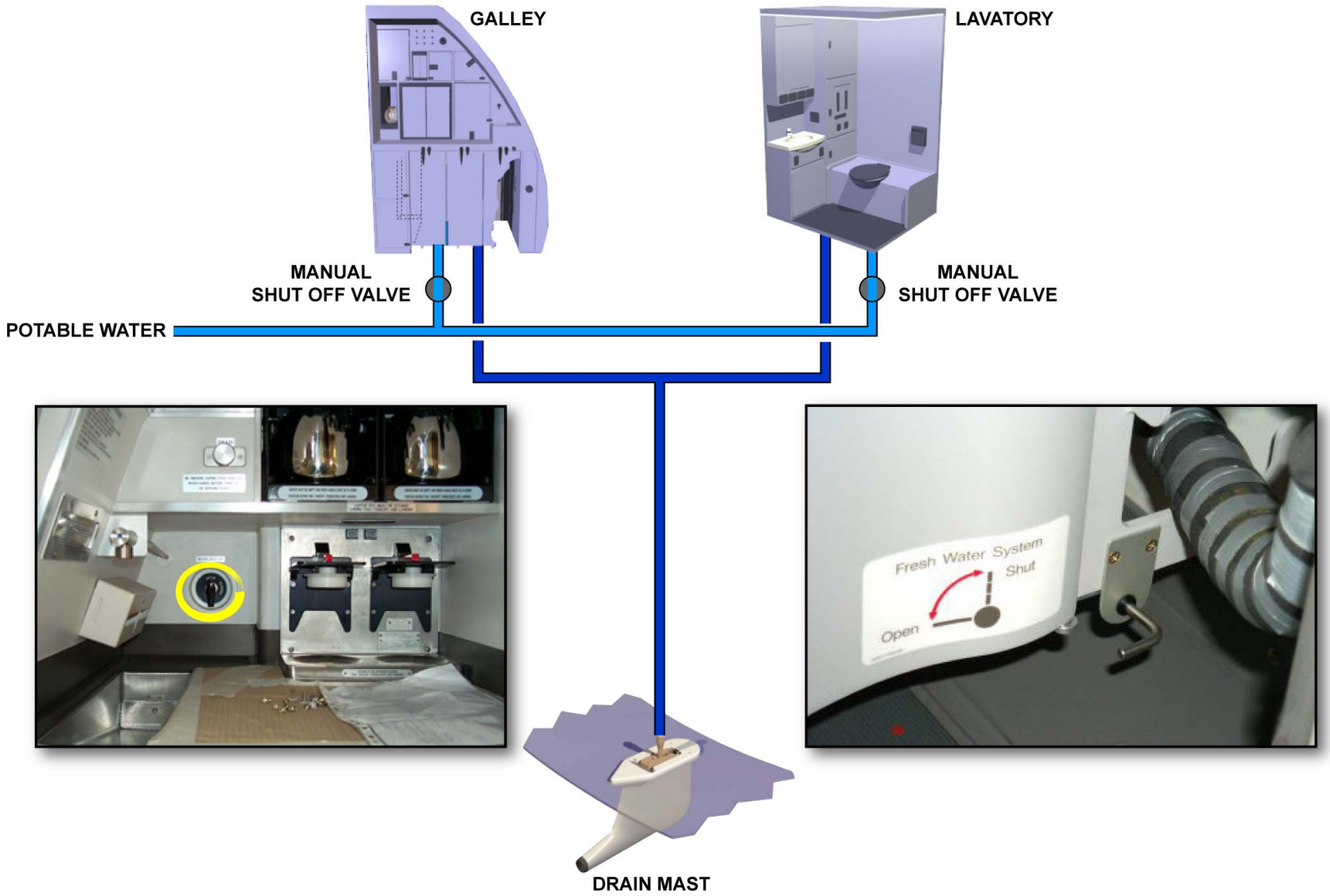


SERVICING - TOILET SYSTEM SERVICING

WATER/WASTE SYSTEM LINE MAINTENANCE (2)

MEL/DEACTIVATION

If the drain mast is not heated, the aircraft can be dispatched provided that the associated galleys or toilets are not used (toilet door locked and placarded "Inoperative") and their water shut off valves are closed.



MEL/DEACTIVATION

WATER/WASTE SYSTEM LINE MAINTENANCE (2)

MAINTENANCE TIPS

POTABLE WATER SYSTEM DRAINING IN COLD WEATHER CONDITIONS

In cold weather conditions, the potable water system must be drained to prevent damage to the system by ice. To know if it is necessary to drain the potable water system, refer to the water system drain configuration table in the AMM 12-24-38. If the bleed air system is off and the external air temperature is below 0 °C (32 °F), the drain valves must remain open after the potable water system is drained to prevent damage to the potable water system. The cold weather maintenance procedures for the potable water system are given in the AMM 12-31-38.

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WATER SYSTEM DRAIN CONFIGURATION

CONFIGURATION				EXPOSURE TIME IN (Hours:Min)	DEPRESSURIZATION REQUIRED	WATER TANK DRAIN REQUIRED	PURGE OF SYSTEM REQUIRED
AIR CONDITIONNING	HEATING WATER WASTE SYS	CABIN TEMPERATURE	OUTSIDE AIR TEMPERATURE				
ON	ON/OFF	ABOVE 10°C (50°F)	BETWEEN 0 and -15°C (32 and 5°F)	ANY	NO	NO	NO
	ON	ABOVE 10°C (50°F)	BELOW -15°C (5°F)	1:15	YES		
OFF	ON		BETWEEN 0 and -7°C (32 and 19.4°F)	1:30			
			BETWEEN -7 and -15°C (19.4 and 5°F)	0:30			
			BELOW -15°C (5°F)	ANY			
OFF	OFF		BETWEEN 0 and -7°C (32 and 19.4°F)	1:30		YES	YES
			BETWEEN -7 and -15°C (19.4 and 5°F)	0:30			
			BELOW -15°C (5°F)	ANY			

You must refill the tank with water not more than 30 min before you start the engines. If the temperature in the aircraft is below 4°C (39.2°F), pre-condition the aircraft.

MAINTENANCE TIPS - POTABLE WATER SYSTEM DRAINING IN COLD WEATHER CONDITIONS

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